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THE

JOURNAL

OF THE

ROYAL GEOGRAPHICAL SOCIETY.

VOLUME THE FORTY-FIRST.

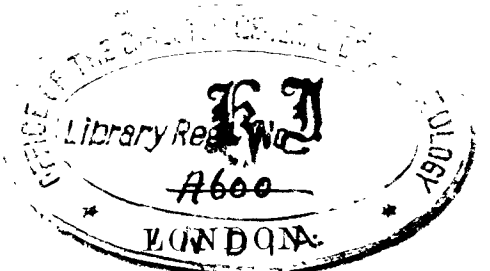
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*** A map of Western South America, to illustrate Mr. Markham's paper on the Incas, not being ready, is deferred to the next volume of the Journal.

Royal Geographical Society.

1871.

REPORT OF THE COUNCIL,

READ AT THE ANNIVERSARY MEETING ON THE 22ND MAY.

THE Council have to submit to the Fellows the following Report on the financial and general condition of the Society.

Members.—During the year ending April 30th, 1871, 156 new Members have been elected, 14 of whom have paid their Life Compositions. In the previous year, the elections of Ordinary Fellows amounted to 189; and in 1869, to 175. The losses the Society has sustained are 57 by death (two of whom were Honorary Members), and 36 by resignation; besides these, 37 have been struck off the list for arrears of subscription; making a total loss of 130. The net increase for the year is, therefore, 26; in 1870, the increase was 101; in 1869, 87; in 1868, 79; and in 1867, 26.

Finances.—The balance-sheet for the financial year (Jan. to Dec., 1870) shows, as will be seen (Appendix A), after deducting balance and proceeds of sale of Funded property, an income of 8042*l.* 6*s.* 1*d.*; which is an increase of 1182*l.* 10*s.* 1*d.* over the previous year, when the amount was 6859*l.* 16*s.* In 1868 the income was 5991*l.* 4*s.*; in 1867, 5462*l.* 7*s.* 11*d.*; and in 1866, 5085*l.* 8*s.* 3*d.* In the income for 1870 is included 1800*l.*, the amount of a legacy bequeathed by the late Mr. Alfred Davis. The amount received from subscriptions was more by 821*l.* than in 1869.

The ordinary expenditure was 3845*l.* 10*s.* 6*d.*—a decrease of

609*l.* 1*s.* 7*d.*, as compared with the previous year, 1869; this lessened expenditure was almost wholly caused by a diminution of the grants to Expeditions; the sum thus expended in 1869 having been 518*l.* 7*s.*, and in 1870 only 69*l.* 12*s.* 6*d.*

During the year, the purchase-money of the freehold property, No. 1, Savile Row, bought by the Council, with the consent of the Fellows assembled in Special General Meeting, was provided by the sale of Funded property to the amount of 15,250*l.* Three per Cents. and India Debentures, producing the sum of 14,170*l.* 2*s.* 5*d.* To adapt the house for the use of the Society—building a large Map-room, and extending the accommodation for Library and offices—a further expenditure of 3340*l.* has been incurred, besides 124*l.* in additions to the original plans. These items will appear in the expenditure for 1871. The Council congratulate the Fellows on the approaching completion of this large building, their own property, in which the space for storing and arranging the large collections of maps and books will be very much greater than it is in the house they at present occupy in Whitehall Place, the lease of which terminates next September. The extensive alterations have been superintended by Mr. James Fergusson and Mr. R. T. Cocks, members of the Building Committee, to whom the thanks of the Society are due.

The Finance Committee of Council have continued, as before, to hold their monthly meetings, and supervise the Society's accounts.

The Annual Audit was held in the month of April: Sir Charles Nicholson, Bart., and Mr. Charles White acting as Auditors for the Council; and Sir George Balfour and Mr. H. Jones Williams on behalf of the Fellows. The thanks of the Council and the Society are due to these experienced gentlemen for devoting so much of their valuable time to this important task.

STATEMENT showing the RECEIPTS and EXPENDITURE of the Society from the Year 1848 to the 31st Dec. 1870.

Year.	Cash Receipts within the Year.			Cash Amounts invested in Funds.			Deducting Amounts invested in Funds; actual Expenditure.		
	£.	s.	d.	£.	s.	d.	£.	s.	d.
1848	696	10	5	..	..		755	6	1
1849	778	3	0	..	..		1098	7	6
1850	1036	10	5	..	..		877	2	10
1851	1056	11	8	..	..		906	14	7
1852	1220	3	4	..	..		995	13	1
1853	1917	2	6	..	..		1675	6	0
1854	2565	7	8	..	..		2197	19	3
1855	2584	7	0	..	..		2636	3	1
1856	3372	5	1	533	10	0	2814	8	1
1857	3142	13	4	378	0	0	3480	19	9
1858	3089	15	1	..	..		2944	13	6
1859	3471	11	8	950	0	0	3423	3	9
1860	6449	12	1	466	17	6	5406	3	7
1861	4792	12	9	1358	2	6	3074	7	4
1862	4659	7	9	1389	7	6	3095	19	4
1863	5256	9	3	1837	10	0	3655	4	0
1864	4977	8	6	1796	5	0	3647	7	10
1865	4905	8	3	1041	5	0	4307	4	5
1866	5085	8	3	1028	15	0	4052	15	0
1867	5462	7	11	1029	0	6	3943	17	4
1868	5991	4	0	1857	3	9	4156	17	10
1869	6859	16	0	2131	5	0	4646	0	8
1870	8042	6	1	3802	6	0	3845	10	6

In 1856 a Treasury Grant of 1000*l.* for the East African Expedition received.

In 1860 a Treasury Grant of 2500*l.* for the East African Expedition received.

In 1869 Legacy of Mr. Benjamin Oliveira, 1506*l.* 17*s.* 1*d.*

In 1870 Legacy of Mr. Alfred Davis, 1800*l.*

STATEMENT showing the Progress of the INVESTMENTS of the Society from the Year 1832 to the 31st Dec. 1870.

End of the Year, Dec. 31.	Cash invested.			Amount of Stock.		
	£.	s.	d.	£.	s.	d.
1832	3657	10	0	4000	0	0
1833	4130	0	0	4500	0	0
1834	4426	0	0	4800	0	0
1835	4426	0	0	4800	0	0
1836	4426	0	0	4800	0	0
1837	4426	0	0	4800	0	0
1838	4426	0	0	4800	0	0
1839	4129	15	0	4500	0	0
1840	3788	10	0	4150	0	0
1841	2801	0	0	3150	0	0
1842	2801	0	0	3150	0	0
1843	2219	18	6	2578	4	4
1844	2219	18	6	2578	4	4
1845	2219	18	6	2578	4	4
1846	1933	1	0	2278	4	4
1847	2133	1	0	2502	6	2
1848	1886	16	8	2224	1	10
1849	1886	16	8	2224	1	10
1850	1886	16	8	2224	1	10
1851	1886	16	8	2224	1	10
1852	1886	16	8	2224	1	10
1853	1662	14	10	2000	0	0
1854	1662	14	10	2000	0	0
1855	1662	14	10	2000	0	0
1856	2216	4	10	2600	0	0
1857	2594	4	10	3000	0	0
1858	2594	4	10	3000	0	0
1859	3544	4	10	4000	0	0
1860	4011	2	4	4500	0	0
1861	5369	4	10	6000	0	0
1862	6758	12	4	7500	0	0
1863	8596	2	4	9500	0	0
1864	10365	7	4	11500	0	0
1865	11406	12	4	12500	0	0
1866	12435	7	4	13500	0	0
1867	13464	7	10	14500	0	0
1868	15321	11	7	16250	0	0
1869	17452	16	7	18250	0	0
1870	19250	0	0	6700	0	0*

* Of which,—4000*l.* is India 5 per Cent. Stock,
1800*l.* Great Western Railway Debenture Stock,
900*l.* Great Indian Peninsula Railway Stock.

Amount of Stock sold to purchase No. 1, Savile Row, 14,170*l.* 2*s.* 5*d.*

Publications.—The 40th volume of the 'Journal' was published early in the present month, and attention is called to

the fact of the great increase in size, and in the number and importance of the maps, as compared with previous years. The 14th volume of the 'Proceedings' has also been completed, and one part of the new volume issued, since the last Report.

The last Edition of the 'Hints to Travellers,' which was edited by a Committee of the Council and issued *gratis* by the Society, having become exhausted, the same Committee has been again occupied in preparing a new and enlarged edition, which will soon be ready for publication.

Library.—The additions to the Library during the year amount to 1073 volumes of books and pamphlets, of which 120 were obtained by purchase, and the remainder by donation and exchange.

As in former years the Library has been superintended by the Library Committee of Council, on whom devolves the selection of books for purchase, and the direction of the new Library Catalogue, of which mention has been made in the Reports of several previous years. The Council have the satisfaction to state that the Supplementary Alphabetical Catalogue, containing all additions to the Library since the large Catalogue of 1865, is now printed and ready for distribution. The Classified Catalogue, in which all the works contained in the two alphabetical volumes will be arranged in the order of countries and places, is in the press, and will be completed in a few days. The Council believe that this last mentioned work will be a boon to all members of the Society who are engaged in research, or interested in geographical subjects and in Travels, as it will show at a glance all the important works and memoirs that have been published on any given country or place, about which the inquirer is seeking information. Both the new Catalogues have been compiled by Mr. Evans, of the British Museum. The probable cost of printing them is shown in the Table of Estimates for 1871 (Appendix B).

Map-Collection.—The additions to this Department during the past year have consisted of 2718 sheets of Charts and Maps; 47 Photographs, and 6 Diagrams; with very few exceptions all have been obtained by donation.

The Council have to express their thanks to Colonel Sir Henry

James, Director of the Ordnance Survey, for the readiness with which the desiderata in such Maps of the Survey, as were authorised to be presented to our collection by the Secretary of State for War, have been furnished by him, and for the punctuality in the transmission of new maps as published. 1743 sheets of the Survey have thus been added during the year.

Among the other accessions have been the following:—

73 Sheets of Admiralty Charts. Presented by the Lords Commissioners of the Admiralty, through Admiral G. H. Richards, R.N., Hydrographer.

975 Sheets of the India Survey. Presented by the India Office, through Colonel H. C. Thuillier, Surveyor-General of India.

154 Sheets of French Charts. Presented by the Dépôt de la Marine.

5 Sheets of Geological Survey of Sweden. Presented by the Geological Society of Sweden.

Carte Lithologique des Mers de l'Amérique. By M. Delesse. 1870.

10 Sheets. Government Map of France, scale $\frac{1}{80000}$; photo-zincographed by the Ordnance Survey, and presented by the War Office through Sir E. Lugard.

47 Photographs of the Georgian Churches in Armenia. Presented by Mr. Ermadoff.

A Medallion of Sir John Franklin. Presented by Lady Franklin, through Admiral R. Collinson, C.B.

Maps of 1r. Petermann's Geographische Mittheilungen. Presented by the Editor.

Numerous Maps of the Franco-German War; published by E. Stanford, Esq., F.R.G.S.; A. K. Johnston, jun., and other London publishers.

Grants to Travellers.—The sum of 69*l.* 12*s.* 6*d.* has been expended in the purchase of instruments for loan or gift to travellers, or in the computation of their observations. Of this amount 35*l.* 5*s.* was incurred on behalf of the Rev. T. Wakefield, Missionary at Mombaz, for observations in Eastern Africa; in which region he has already gathered much geographical information, as shown by his Memoir and Map in the new

volume of the Society's 'Journal' (Vol. xl.). Mr. C. T. Drake had instruments to the value of 6*l.* 3*s.* 6*d.*, for his expedition to the northern part of the Sinaitic Peninsula; and to Mr. R. B. Shaw was lent a set, at the cost of 23*l.* 4*s.*, for his recent journey to Yarkand, which he has turned to so much use in obtaining data for determining the vexed problem of the longitude of that city.

APPENDIX A.

BALANCE-SHEET FOR THE YEAR 1870.

Receipts.

1870.	£.	s.	d.	£.	s.	d.
Balance in Banker's hands 31st Dec. 1869	637	1	10			
Ditto Accountant's Ditto	15	4	1			
				652	5	11
Subscriptions of 1500 Fellows	2999	10	0			
Entrance Fees of 196 Ditto	588	0	0			
Life Compositions of 38 Ditto	950	0	0			
Arrears of Subscriptions	360	0	0			
				4,897	10	0
Parliamentary Grant	..	..		500	0	0
Royal Premium	..	..		52	10	0
Sale of Publications	.	..		110	5	5
Advertisements	..	..		5	9	6
Half Year's Dividend on 5000*l.* India 5 per Cents.	97	18	4			
Half Year's Dividend on 1000*l.* ditto Debentures	24	9	7			
Half Year's Dividend on 12,250*l.* New 3 per Cents.	179	18	6			
Half Year's Dividend on 2000*l.* India 4 per Cents.	39	3	4			
Half Year's Dividend on 4000*l.* India 5 per Cents.	98	6	8			
Half Year's Dividend on 900*l.* Great Indian Peninsula Railway Stock	22	2	6			
Half Year's Dividend on 12,250*l* New 3 per Cents.	180	13	9			
Half Year's Dividend on 1500*l.* India 4 per Cent. Certificates	29	10	0			
				672	2	8
Amount of Legacy left by the late Mr. Alfred Davis (less duty)	..	..		1,800	0	0
Amount realised by the Sale of Funded Property, as under:—						
1000*l.* India 5 per Cent. Debentures	1,045	2	5			
12,250*l.* New 3 per Cents.	11,116	17	6			
2000*l.* India 4 per Cents.	2,008	2	6			
				14,170	2	5
Miscellaneous	..	..		4	8	6
				£22,864	14	5

Expenditure.

1870.	£.	s.	d.	£.	s.	d.
Rent, Taxes, and House Expenses				499	16	0
Salaries and Wages				1,394	8	4
Library and Map-Rooms				183	9	10
Subscriptions, &c., returned				29	0	0
Gold Medals, School Prizes, and other awards				108	10	0
Postages, &c.				118	7	3
Office Expenses				248	17	10
Publications, Illustrations, &c. ..				1,122	10	0
Furniture and Repairs				10	3	3
Expeditions				69	12	6
Miscellaneous				60	15	6
				3,845	10	6
Stocks Purchased:—						
1000*l.* India 4 per Cent. Certificates	1011	5	0			
1800*l.* Great Western Railway Debenture Stock	1800	0	0			
900*l.* Great Indian Peninsula Railway Stock	991	1	0			
				3,802	6	0
Purchase of No. 1, Savile Row (including Solicitor's Account) ..				14,527	0	2
Balance in Banker's hands, 31st December, 1870	672	8	10			
Ditto Accountant's ditto	17	8	11			
				689	17	9
				£22,864	14	5

(Signed) R. C COCKS, *Treasurer.*

Audited 3rd April, 1871. C NICHOLSON, CHARLES WHITE, G. BALFOUR, H. JONES WILLIAMS, } *Auditors.*

APPENDIX B.

ESTIMATE FOR THE YEAR 1871.

Receipts.

	£.	s.	d.
Cash Balance	689	17	9
Annual Subscriptions	3050	0	0
Life Compositions	500	0	0
Entrance Fees	450	0	0
Arrears of Subscriptions	300	0	0
Royal Premium for 1871	52	10	0
Parliamentary Grant	500	0	0
Sale of Publications, Advertisements, &c.	115	0	0
Dividends and Small Receipts	312	0	0
Sale of £3,500 India 5 per Cent.	3,850	0	0
	£9819	7	9

Expenditure.

	£.	s.	d.
Rent, Taxes, and House Expenses (including repairs to 15, Whitehall Place)	625	0	0
Salaries and Wages	1450	0	0
Library and Map-Rooms	300	0	0
Gold Medals and other Awards	125	0	0
Postages, &c.	120	0	0
Office Expenses	300	0	0
Journal and Proceedings	1200	0	0
Library Catalogue (alphabetical and classified)	600	0	0
Alterations to No. 1, Savile Row (including Architect's fee, Clerk of Works, &c.)	3750	0	0
Removal and Furniture	800	0	0
Cash Balance	549	7	9
	£9819	7	9

Library Regulations.

I. The Library will be open every day in the week (Sundays excepted) from 10.30 in the morning to 4.30 in the afternoon,* except on New-Year's Day, Good Friday to Easter Monday inclusive, and Christmas week; and it will be closed one month in the year, in order to be thoroughly cleaned, viz. from the first to the last day of September.

II. Every Fellow of the Society is entitled (*subject to the Rules*) to borrow as many as four volumes at one time.

Exceptions :—

1. Dictionaries, Encyclopædias, and other works of reference and cost, Minute Books, Manuscripts, Atlases, Books and Illustrations in loose sheets, Drawings, Prints, and unbound Numbers of Periodical Works, *unless with the special written order of the President.*
2. Maps or Charts, *unless by special sanction of the President and Council.*
3. New Works, before the expiration of a month after reception.

III. The title of every Book, Pamphlet, Map, or Work of any kind lent, shall first be entered in the Library-register, with the borrower's signature, or accompanied by a separate note in his hand.

IV. No work of any kind can be retained longer than one month; but at the expiration of that period, or sooner, the same must be returned free of expense, and may then, upon *re-entry*, be again borrowed, provided that no application shall have been made in the mean time by any other Fellow.

V. In all cases a list of the Books, &c., or other property of the Society, in the possession of any Fellow, shall be sent in to the Secretary *on or before the 1st of July in each year.*

VI. In every case of loss or damage to any volume, or other property of the Society, the borrower shall make good the same.

VII. No stranger can be admitted to the Library except by the introduction of a Fellow, whose name, together with that of the Visitor, shall be inserted in a book kept for that purpose.

VIII. Fellows transgressing any of the above Regulations will be reported by the Secretary to the Council, who will take such steps as the case may require.

By Order of the Council.

---

* On Saturday the Library is closed at 2.30 P.M.

ROYAL GEOGRAPHICAL SOCIETY.

Patron.

HER MAJESTY THE QUEEN.

Vice-Patron.

H.R.H. THE PRINCE OF WALES.

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Assistant Secretary and Editor of Transactions.—H. W. BATES, Esq.

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15th March, 1872.

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H.M. Charles XV., Louis Eugene, King of Sweden and Norway.
H.M. Leopold II., King of the Belgians.
H.I.H. the Grand Duke Constantine, President of the Imperial Geographical Society of St. Petersburg.
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Chaix, Prof. Paul .. .. .. Geneva
Coello, Don Francisco .. .. Madrid
Dana, Professor James D., New Haven, Connecticut
D'Avezac, M. .. .. Paris
Dufour, Gen., Director of the Topo. Depart., Switzerland .. .. .. Geneva
Duveyrier, M. Henri .. .. Paris
Ehrenberg, C. P., For. M.R. and L.S., Berlin
Erman, Prof. Adolph .. .. .. Berlin
Faidherbe, Général L., Général Commandant à Bone .. .. Algerie
Figanière, Command. Jorge Cesar, Lisbon
Forchhammer, Prof. P. W. .. .. Kiel
Fremont, General .. .. .. New York
Grinnell, Henry, Esq. V.P. Geogr. Soc. of .. .. New York
Guyot, Prof., LL.D., Princeton, New Jersey
Hanstein, Prof., For. M.R.S. Christiania
Helmersen, Col. P. .. St. Petersburg
Hochstetter, Dr. Ferdinand von, Pres. Imp. Geograph. Soc. of .. .. Vienna
Irminger, Rear-Admiral C. L. C., R.D.N. Copenhagen
Jansen, Captain M. H., D.R.N., Delft, Holland
Jochmus, Field Marshal Lieutenant Baron Vienna
Kennelly, D. J. Esq., F.R.A.S.
Khanikof, M. .. .. Paris
Kiepert, Dr. H. .. .. Berlin
Leal, His Exc. Senhor Fernando da Costa, Governor of Mozambique
Leal, José da Silva Mendes, Minister of the Colonies .. .. Lisbon
Linant Pasha .. .. .. Alexandria
Livingstone, David, Esq., M.D., LL.D.
Lütke, Admiral F. B., Pres. of the Imp. Academy of Sciences .. St. Petersburg
Macedo, J. J. da Costa de .. .. Lisbon
Madoz, Don Pascual .. .. .. Madrid
Malte-Brun, M. V. A., Hon. Sec. Geogr. Soc. of .. .. Paris
Maury, Commodore M. F.
Munzinger, Werner, Esq., C B.
Nardi, Monsignor Francesco .. Rome
Negri, Chevalier Cristoforo .. .. Turin
Osten Sacken, Baron, Sec. to the Imp. Geogr. Soc. of .. .. St. Petersburg
Petermann, Dr. Augustus .. .. Gotha
Philippi, Dr. Rodulfo Armando .. Chili
Platen, His Excellency Count.
Raimondy, Don Antonio .. .. .. Lima
Ranuzzi, Count Annibale .. .. Bologna
Rüppell, Dr. E., For. M.L.S ... Frankfort

SALAS, Don Saturnino, Pres. Topo. Depart., Argentine Repub. .. .. Buenos Ayres
SCHEDA, Herr von, Director of the Imp. Inst. of Military Geogr. .. .. Vienna
SCHERZER, Dr. Karl von .. .. Vienna
SOLDAN, Don Mariano Felipe Paz Lima.
SONKLAR, Lieut.-Col. the Chev. de, Wiener Neustadt, Vienna
STRUVE, Prof. Otto, Imp. Observ. of Pulkowa .. .. .. St. Petersburg
SYDOW, Lt.-Col., Emil von (Chief of the Geog. Dep. of the Staff of the Prussian Army), Behrenstrasse, 66. Berlin
TCHIHATCHEF, M. Pierre de .. Paris
TSCHUDI, Herr T. T. von .. .. Vienna
VANDER MAELEN, Mr. Ph. .. Brussels
VASCONCELLOS É SILVA, Dr. Alfredo Casimiro de .. .. .. Rio de Janeiro
VERNEUIL, M. E. de .. .. .. Paris
VILLAVICENCIO, Don Manuel Guayaquil
WRANGELL, Adm. Baron .. St. Petersburg
ZIEGLER, M. J. M. .. .. Winterthur

FELLOWS.

(15TH MARCH, 1872.)

N.B.—*Those having * preceding their names have compounded for life.*

Year of Election.	
1869	Abbott, Keith E., H.M. Consul. *Odessa.*
1868	*Abbott, Wm. S. D., Esq. 28, *Pembridge-crescent, W.*
1863	Abdy, Rev. Albert, M.A. *Shippon-vicarage, Abingdon; and United University Club, S.W.*
1851	Abinger, W. F. Scarlett, Lord. *Guards' Club, S.W.*
1871	Abney, Lieut. W. de Wiveleslie, R.E. *St. Margaret's, Rochester.*
1865	Acheson, Frederick, Esq., C.E. *Wooden Bridge, Co. Wicklow.*
1861	Acland, J. Barton Arundel, Esq. *Mount Peel, Canterbury, New Zealand. Care of A. Mills, Esq., 34, Hyde-park-gardens, W.*
1867	Adair, Colonel Sir Alex. Shafto. 7, *Audley-square, W.*
1862	Addison, Colonel Thomas, C.B.
1859	Ainslie, Colonel H. Francis. *Burlington-chambers, 180, Piccadilly, W.; and United Service Club, S.W.*
1830	*Ainsworth, W. F., Esq., F.S.A. *Ravenscourt-villa, New-road, Hammersmith, W.*
1859	Airlie, David Graham, Earl of. *Holly-lodge, Kensington, W.*
1860	Aitchison, David, Esq. 5, *Pembridge-square, Bayswater, W.*
1830	*Albemarle, George Thomas, Earl of. 11, *Grosvenor-square, W.; Quiddenham-hall, Larlingford, Norfolk; and Elvedon-hall, Suffolk.*
1862	Alcock, Sir Rutherford, K.C.B. *Athenæum Club, S.W.*
1838	*Aldam, William, Esq. *Frickley-hall, near Doncaster.*
1865	Aldom, Joseph R. Esq., M.A., PH. DR. *Salway-house, Leyton, Essex.*
1857	Aldrich, Captain Robert D., R.N. *Windmill-road, Croydon, Surrey, S.*
1830	Alexander, Colonel Sir Jas. Ed., K.C.L.S., F.R.A.S., F.R.S.E., &c., 14th Regt. *United Service Club, S.W.; and Westerton-house, Bridge of Allan, N.B.*
1870	Alford, Lewis, Esq. 2, *Little Love-lane, E.C.*
1864	Allan, C. H., Esq. *Lloyd's, E.C.; and* 31, *Park-street, Stoke Newington, N.*
1857	Allan, G. W., Esq. *Moss Park, Toronto, Canada. Care of Gen. J. H. Lefroy,* R.A., 82, *Queen's-gate, W.*
1858	Allan, James, Esq. 122, *Leadenhall-street, E.C.*
1871	*Allcroft, John D., Esq. 55, *Porchester-terrace, W.; Harlington, Middlesex; and Stokesay, Shropshire.*

Year of Election.

1865 Allen, James Pearce, Esq. 13, *Waterloo-place, S.W.*

1854 Ancona, J. S., Esq. 8, *John-street, Adelphi, W.C.*

1860 Anderdon, John Edmund, Esq. *Henlade-house, Taunton, Somerset.*

1867 Anderson, Sir Henry L., K.C.S.I. *India-office, S.W.*

1871 Anderson, Sir James. 16, *Warrington-crescent, W.*

1871 Anderson, Sir Wm. Geo., K.C.B. 1, *Buckingham-gate, S.W.*

1862 Anderson, James, Esq. 1, *Billiter-court, City, E.C.*

1861 Anderson, John, Esq. Messrs. W. R. Adamson and Co. *Shanghai. Care of Messrs. Jno. Bard and Co., Hong Kong. Per Messrs. Adam, Thomson, and Co.*, 48, *Lime-street, E.C.*

1868 Anderson, John, Esq. *Conservative Club, S.W.*

1868 Anderson, Joseph, Esq. 7. *Cleveland-square, Hyde-park, W.*

1870 Anderson, William Jas., Esq. *Sans Souci, Newlands, near Cape Town, Cape of Good Hope.*

1856 *Andrew, William P., Esq. 29, *Bryanston-square, W.*

1867 Andrews, G. H., Esq. *The Cedars, New Brentford.*

1866 Andrews, John R., Esq. 14, *Bryanston-square, W.*

1868 Angas, George F., Esq. 72, *Portland-road, Notting-hill, W.*

1861 Annesley, Colonel the Hon. Hugh, M.P. 25, *Norfolk-street, Park-lane, W.*

1860 *Anson, Sir John William Hamilton, Bart. 55, *Portland-place, S.W.; and Sherley-house, Croydon.*

1853 Ansted, Prof. D. T., M.A., F.R.S., &c. 33, *Brunswick-square, W.C.; Athenæum Club, S.W.; and Château Vieux, St. Léonard, Boulogne-sur-Mer.*

1868 *Anstey, Chisholm, Esq. *Bombay. Care of Messrs. King and Co.*

1857 Anstruther, M.-Gen. Philip, C.B., Madras Artil. *Airth-castle, by Falkirk, N.B.*

1864 Anstruther, Lieut. R. L., Rifle Brigade. *Staff-college, Farnboro'-station, Hants.*

1863 Arber, Edward, Esq., A.K.C. 5, *Queen's-square, Bloomsbury, W.C.*

1858 Arbuthnot, George, Esq. 23, *Hyde-park-gardens, W.*

1862 Arbuthnot, Major George, R.H.A. *Cowarth, Sunningdale.*

1861 Archer, Graves Thos., Esq. 1, *Ennismore-place, Prince's-gate, S.W.*

1872 Archibald, Wm. Fredk. A., Esq. *Inglewood, Bickley-park, Kent.*

1866 *Arconati, The Marquis Giammartino. *Casa Prini, Pisa. Care of Messrs. Bocca, Bros., Turin. Per Messrs. Barthes and Lowell, Great Marlborough-street, W.*

1870 Ardagh, John C., Esq., Lieut. R.E. *Junior United Service Club, S.W.*

1855 *Arden, Richard Edward, Esq. *East Burnham-house, Buckinghamshire.*

1858 *Armistead, Rev. Charles John, M.A., F.S.A. *Basing, Basingstoke; and United University Club, S.W.*

1863 Armitage, Edward, Esq. 3, *Hall-road, St. John's-wood, N.W.*

1867 *Armitstead, George, Esq., M.P. *Errol-park, Errol, N.B.*

1857 Armstrong, Sir Alexander, K.C.B., M.D., R.N., F.R.C.P., Director-General of the Navy Medical Department. *Admiralty, Somerset-house, W.C.; and Junior United Service Club, S.W.*

1871 Arrow, Sir Fred. *Trinity-house, Tower-hill, E.C.; and Pilgrim's-hall, Brentwood, Essex.*

Year of Election.	
1830	*Arrowsmith, John, Esq., F.R.A.S. 35, *Hereford-square, Old Brompton, S.W.*
1863	60 Arthur, Captain William, R.N. *The Priory, Leatherhead.*
1869	Ashbee, Edmund Wm., Esq., F.G.S. 17, *Mornington-crescent, Regent's-park, N.W.*
1870	*Ashton, Charles, Esq. *New University Club, S.W.*
1864	*Ashton, R. J., Esq. *Hatton-court, Threadneedle-street, E.C.*
1853	*Ashwell, James, Esq., M.A., F.G.S.
1830	*Atkins, John Pelly, Esq., F.S.A. *Halsted-place, near Sevenoaks.*
1870	Atkinson, William, Esq., F.L.S. &c. 47, *Gordon-square, W.C.*
1869	Atlee, Charles, Esq. *The Park, Ealing, W.*
1860	Attwell, Professor Henry. *Barnes, S.W.*
1869	Auld, Thomas Reid, Esq. 36, *Portland-place, W.*
1859	70 Austen, Major Henry H. Godwin, 24th Foot, Trig. Survey, Punjaub. *Junior United Service Club, S.W.; and Chilworth-manor, Guildford, Surrey.*
1863	Austin, John G., Esq. *Care of the Colonial Company, 16, Leadenhall-street, E.C.*
1854	Ayrton, Right Honourable Acton S., M.P. 11, *Bolton-street, Piccadilly; and Office of Works, Whitehall.*
1846	*Ayrton, Frederick, Esq.
1866	*Babington, William, Esq., *St. Kilda, Buckhurst-hill, Essex; and Bonny River, West Coast of Africa.*
1836	*Back, Admiral Sir Geo., D.C.L., F.R.S. 109, *Gloucester-place, Portman-sq., W.*
1866	Bacon, Geo. Washington, Esq. 127, *Strand, W.C.*
1864	Badger, Rev. Geo. P. 21, *Leamington-road-villas, Westbourne-park, W.*
1863	Bagot, Christopher N., Esq. *Oriental Club, W.*
1862	Bagot, Capt. L. H. *Care of C. S. Bagot, Esq., 40, Chancery-lane, W.C.*
1859	80 Bailey, L. C., Esq., Staff Commander, R.N. *Topographical Department, New-street, Spring-gardens, S.W.*
1857	Baillie, Lieut.-Col. John (Bengal Staff Corps.) 22, *Palace-gardens-terrace, Kensington, W.*
1857	Baines, Thomas, Esq. *Care of E. L. King, Esq., 35, Austin-street, King's Lynn, Norfolk.*
1861	*Baker, John, Esq.
1862	Baker, Captain Robert B. *Oriental Club, Hanover-square, W.*
1865	Baker, Sir Samuel White, Pasha, F.R.S. *Hedenham-hall, Bungay, Norfolk; and* 118, *Belgrave-road, S.W.*
1871	Baker, T. B., Esq., C.B. *Wickham-park-terrace, Lewisham.*
1861	Baldwin, William Charles, Esq. *Leyland-vicarage, Preston.*
1861	Balfour, David, Esq. *Balfour-castle, Kirkwall, N.B.*
1847	Balfour, Maj.-Gen. Sir George, K.C.B., R.A. 6, *Cleveland-gardens, Hyde-park, W.; and Oriental Club, Hanover-square, W.*
1870	90 Balfour, Captain George M., R.N. 3, *Surrey-villas, Upper Norwood.*
1853	Balfour, John, Esq. *New South Wales; and Colinton, Queensland;* 39, *St. James's-street, S.W.*
1860	Ball, John, Esq., F.R.S. 24, *St. George's-road, Eccleston-square, S.W.*
1852	Bancroft, Lieut.-Col. W. C., 16th Regt. *M'Gregor and Co., Charles-street, S.W.*

Year of Election.	
1862	Banks, George F., Esq., Surgeon R.N.
1858	Bannerman, Sir Alexander, Bart. 46, *Grosvenor-place, S.W.*
1869	Barchard, Francis, Esq. *Horsted-place, Uckfield.*
1870	Barclay, Wm. L., Esq., B.A. *Leyton, Essex.*
1863	Barford, A. H., Esq., M.A. 1, *Cornwall-terrace, Regent's-park, N.W.*
1870	Baring, Evelyn, Esq., Lieut. R.A. 11, *Berkeley-square, W.*
1835	100 *Baring, John, Esq. *Oakwood, Chichester.*
1844	*Baring, Thomas, Esq., M.P., F.R.S. 41, *Upper Grosvenor-street, W.*
1870	Barkly, Sir Henry, K.C.B., Governor of the Cape. *Care of the Colonial Office, S.W.*
1862	Barlee, Frederick Palgrave, Esq. *Perth, Western Australia. Care of G. Laurence, Esq.*, 12, *Marlboro'-road, Lee, S.E.*
1868	Barlow, Frederick Thomas Pratt, Esq. 26, *Rutland-gate, S.W.*
1871	Barnes, Robert, Esq., M.D. 31, *Grosvenor-street, W.*
1864	Barnett, H. C., Esq., J.P. *York, West Australia.*
1867	*Barns, John W., Esq. *Bhawulpore, Punjaub, India; care of Messrs. Grindlay.*
1870	Barr, Edward G., Esq. 76, *Holland-park, W.; and* 36, *Mark-lane, E.C.*
1859	Barrington, George, Viscount, M.P. 20, *Cavendish-square, W.*
1867	110 Barrington Ward, Marcus J., Esq., B.A., S.C.L. OXON., F.L.S., &c. *Clifton College, Bristol; and* 14, *Alfred-street, Belfast.*
1833	Barrow, John, Esq., F.R.S., F.S.A. 17, *Hanover-terrace, Regent's-park, N.W.*
1863	Barry, Alfred, Esq.
1857	Bartholomew, John, Esq. 17, *Brown-square, Edinburgh.*
1861	Bartlett, Herbert Lewis, Esq. *Union Club, S.W.*
1862	Barton, Alfred, Esq., M.D. *Hampton-court.*
1837	*Bateman, James, Esq., F.R.S., F.L.S. 9, *Hyde-park-gate South, W.*
1859	Bateman, John F., Esq., C.E., F.R.S. 16, *Great George-street, Westminster, S.W.*
1866	Bates, Henry Walter, Esq., F.Z.S., F.L.S. 1, *Savile-row, W.*
1866	Bateson, George, Esq. *Heslington-hall, York.*
1866	120 Batten, John H., Esq. *Alverne-hill, Penzance.*
1864	Bax, Captain Henry G.
1858	Baxendale, Joseph H., Esq. *Worplesdon, Guildford.*
1867	*Baxter, Sir David, Bart. *Dundee;* 5, *Moray-place, Edinburgh; and Kilmaron-castle, Cupar-Fife.*
1867	Baxter, Richard, Esq., Barrister-at-Law. 19, *Leinster-gardens, Bayswater, W.*
1867	Bayley, Chas. Jno., Esq., C.B., M.A. 51, *Victoria-road, Kensington, W.*
1863	Bayley, H., Esq. *Blackheath-park, Kent.*
1862	Bayly, Lieut.-Col. John, R.E. *Ordnance Survey Office;* 131, *St. George's-road, Pimlico, S.W.*
1862	Baynes, Lieut.-Col. R. Stuart. *Army and Navy Club, S.W.; and* 38, *Jermyn-street, S.W.*
1868	Baynton, Captain Edward. *Trafalgar-lodge, Shirley, Southampton.*
1871	130 Beadon, Sir Cecil, K.C.S.I. *Cheltenham; and* 15, *Elvaston-place, South Kensington, W.*

Year of Election	
1852	Beardmore, Nathaniel, Esq., C.E. 30, *Great George-street, Westminster, S.W.*
1854	*Beaufort, William Morris, Esq., Bengal Civil Service. *Oriental Club, Hanover-square, W.*
1856	Beaumont, John Aug., Esq. 81, *Lancaster-gate, W.; and Wimbledon-park-house, Wimbledon, S.W.*
1870	*Beaumont, Somerset, Esq., M.P. 23, *Park-street, Park-lane, W.*
1851	*Beaumont, Wentworth B., Esq., M.P. 144, *Piccadilly, W.; Bywell-hall, Newcastle-upon-Tyne; and Bretton-park, Wakefield.*
1872	Beavan, Lieut. Reginald. *Messrs. Grindlay and Co., 55, Parliament-street, S.W.*
1867	*Beazeley, Michael, Esq., M.I.C.E. *Trinity Works, Penzance, Cornwall.*
1871	Beazley, Captain Geo. G., 83rd Regiment. *Army and Navy Club, S.W.*
1865	Bebb, Horatio, Esq. 13, *Gloucester-place, W.; and Leamington.*
1861	140 Beckett, Staff Commander James F., R.N., F.R.S.A. 23, *Stafford-terrace, Kensington, W.*
1838	*Beckford, Francis Love, Esq. *Orford-house, Ham-common, Surrey.*
1870	*Bective, Thomas, Earl of. 35, *Dover-street, W.; and Underley-hall, Kirkby Lonsdale, Westmoreland.*
1859	Bedford, Rear-Admiral G. Augustus, R.N. *South-view, Widmore-road, Bromley, Kent.*
1870	*Beer, Julius, Esq. 23, *Park-crescent, Portland-place, W.*
1868	Bedingfeld, Felix, Esq., C.M.G. 36, *Green-street, Park-lane; and Reform Club, S.W.*
1861	*Begbie, James, Esq. 17, *Trinity-square, Tower-hill, E.C.*
1860	Begbie, Thomas Stirling, Esq. 4, *Mansion-house-place, E.C.*
1846	*Beke, Charles Tilstone, Esq., PH. DR., F.S.A., &c. *London Institution, Finsbury-circus, E.C.*
1853	Belcher, Rev. Brymer. *St. Gabriel's, Pimlico, S.W.*
1830	150*Belcher, Vice-Adm. Sir Edward, K.C.B., F.R.A.S. 22A, *Connaught-square, W.*
1858	Beldam, Edw., Esq. *Poyston, Herts.*
1863	Belmore, The Earl of. *Governor of New South Wales.*
1858	*Bell, C. Davidson, Esq., Surveyor-General, Cape of Good Hope. *Cape Town. Care of the S. A. Pub. Library, Cape Town. Per Messrs. H. S. King and Co.*
1871	Bell, Major, M.N. 76, *Jermyn-street, S.W.*
1868	Bell, Wm. A., Esq., B.A., M.D. 18, *Hertford-street, Mayfair, W.*
1864	Bellamy, Edward, Esq. 10, *Duke-street, St. James's, S.W.*
1872	Bellville, Alfred, Esq. 20, *Penn-road-villas, Holloway, N.*
1870	Benjamin, Joseph, Esq. 22, *Glasshouse-street, Regent-street, W.*
1830	*Bennett, John Joseph, Esq., F.R.S. *Sandrock, Maresfield, Sussex.*
1857	160 Bennett, J. Risdon, Esq., M.D. 15, *Finsbury-square, E.C.*
1856	*Benson, Robert, Esq. 16, *Craven-hill-gardens, Bayswater, W.*
1856	*Benson, William, Esq., Barrister-at-Law. 16, *Craven-hill-gardens, Bayswater, W.*
1830	Bentham, George, Esq., Pres. L.S., F.R.S. 25, *Wilton-place, S.W.*
1868	Bentley, George, Esq. *Upton-park, Slough.*
1870	*Benyon, Wm. H., Esq. *Stainley-hall, Ripon, Yorkshire.*

Year of Election.		
1859		Berens, H. Hulse, Esq. *Sidcross, Foot's Cray, Kent.*
1865		Bernard, P. N., Esq. 16, *Leadenhall-street, E.C.*
1866		Berridge, F., Esq. *Winchester-house, Winchester-road, Adelaide-road, N.W.*
1856		Berry, Josiah, Esq. 16, *Regent-square, W.C.*
1872	170	Berthon, Peter Hy., Esq. 20, *Margaret-street, Cavendish-square, W.*
1871		Best, Commr. Jno Chas. *Abbott's Ann-rectory, Andover.*
1863		Best, William, Esq. *Kelstone, Millbrook, S. Hants.*
1867		Best, William John, Esq. *Franklin-street, Belfast.*
1867		Bethune, Alexander M., Esq. *Otterburn, Hamlet-road, Upper Norwood; and* 122, *Leadenhall-street, E.C.*
1842		*Bethune, R.-Adm. C. R. Drinkwater, C.B. 4, *Cromwell-rd., South Kensington, W.*
1836		Betts, John, Esq. 115, *Strand, W.C.*
1868		Bevan, George Phillips, Esq. *Junior Athenæum Club.*
1866		Bevan, William, Esq. 8, *Cedars-road, Clapham-common, S.*
1862		Bicker-Caarten, Peter, Esq. 30, *Northumberland-place, Bayswater, W.*
1871	180	Bickersteth, Ven.-Archd. D.D. *The Prebendal, Aylesbury, Buckinghamshire.*
1868		*Bickmore, A. S., Esq., M.A. 252, *Pearl-street, New York.*
1866		Bicknell, Algernon S., Esq. 37, *Onslow-square, S.W.*
1860		Bidder, G. Parker, Esq., C.E. 24, *Gt. George-st., S.W.; and Mitcham, Surrey, S.*
1871		Biddulph, Geo. Tournay, Esq. 43, *Charing-cross, S.W.*
1869		Bidie, Geo., Esq., M.D., &c. Madras Establishment, Madras. *Care of Messrs. H. S. King and Co.*
1865		Bidwell, Charles Toll, Esq. *Garrick Club,* 35, *King-st., Covent-garden, W.C.; and* 28, *Grosvenor-street, Eaton-square, S.W.*
1859		Bigge, Frederick W., Esq. *Debden-hall, Saffron Walden.*
1868		Biggs, C. H. Walker, Esq. 2, *Alexandra-terrace, Reading.*
1850		Bigsby, John J., Esq., M.D., F.R.S. 89, *Gloucester-place, Portman-square, W.*
1860	190	Birch, H. W., Esq. 46, *Welbeck-street, Cavendish-square, W.*
1858		Birch, John William, Esq. 9D, *New Broad-st., E.C.; and* 27, *Cavendish-sq., W.*
1862		*Birchill, Captain B. H. H. *Old-lodge, Hartfield, Tunbridge-wells.*
1867		*Bischoffsheim, Henri Louis, Esq. 75, *South Audley-street, W.*
1858		Bishop, George, Esq., F.R.A.S. *Union Club, S.W.; and The Meadows, Twickenham, S.W.*
1861		Bishop, James, Esq. 11, *Portland-place, W.*
1870		Bishop, Wm. Henry, Esq. 8, *Prince of Wales-terrace, Kensington-palace, W.*
1867		Bisson, Frederick S. de Carteret, Esq., Lieut. R.I.M. 70, *Berners-street, W.*
1870		Black, Andrew H., Esq. 23, *Royal-crescent, Glasgow.*
1860		*Black, Francis, Esq. 6, *North-bridge, Edinburgh.*
1867	200	Black, Thomas, Esq., Superintendent P. and O. Steam Navigation Company's Dockyard. *Oriental-place, Southampton.*
1869		Blacker, Louis, Esq. *Flowermead, Wimbledon-park, S.W.*
1870		Blackie, Thos. M., Esq. *Chipping-hill School, Witham, Essex.*
1849		Blackie, W. Graham, Esq., PH. DR. 36, *Frederick-street, Glasgow.*
1871		Blackmore, W., Esq. *Founder's-court, Lothbury, E.C.*

Year of Election.	
1862	*Blackstone, Frederick Elliot, Esq., B.C.L. *British Museum, W.C.*
1869	Blaine, Henry, Esq. 2, *Cleveland-road, Castle-hill, Ealing, W*
1868	Blair, William Edward, Esq. *Windham Club, S.W.*
1871	Blair, H. M., Esq. 12, *Stanhope-place, Hyde-park, W.; and Union Club, S.W.*
1865	Blake, Brig.-Gen. H. W.
1857	210*Blake, Wollaston, Esq, F.R.S. 8, *Devonshire-place, W.*
1861	*Blakeney, William, Esq., R.N. *Hydrographic-office, S.W.*
1868	Blakiston, Matthew, Esq. *Mobberley, Knutsford, Cheshire.*
1857	Blakiston, Captain Thomas, R.A. 28, *Wellington-street, Woolwich, S.E.*
1868	Blanc, Henry, Esq., M.D., &c. *Care of Messrs. H. S. King and Co.*, 45, *Pall-mall, S.W.*
1857	Blanshard, Richard, Esq. *Fairfield, Lymington, Hants.*
1865	Blaxall, Francis H., Esq., M.D. *Tendring, near Colchester.*
1854	Blencowe, W. Robert, Esq. *The Hook, Lewes.*
1861	Blenkin, William, Esq. *Addlestone, Surrey.*
1839	*Blewitt, Octavian, Esq. 4, *Adelphi-terrace, Strand, W.C.*
1864	220 Blore, Edward, Esq., D.C.L., F.R.S., F.S.A., &c. 4, *Manchester-square, W.*
1866	Blow, William Wootton, Esq. *Care of Robert Evans, Esq., Belvedere-park, North Kent.*
1861	Bloxsome, Oswald, jun., Esq. *Berrington-hall, Leominster.*
1868	Blumberg, George F., Esq. 4, *Ladbroke-square, Kensington-park, W.*
1837	*Blunt, Jos., Esq.
1863	*Blunt, Wilfred S., Esq. *Worth, Crawley, Sussex.*
1868	Blyth, Philip P., Esq. (J.P. for Middlesex). 53, *Wimpole-street, W.*
1871	Blyth, Henry, Esq. 53, *Wimpole-street, S.W.*
1858	Bohn, Henry G., Esq. *York-street, Covent-garden, W.C.; and North-end-house, Twickenham, S.W.*
1850	Bollaert, William, Esq. 36, *Weymouth-street, Portland-place, W.*
1862	230 Bolton, Major Francis John, 12th Regiment. 2, *Westminster-chambers, S.W.*
1861	Bompas, George Cox, Esq. 15, *Stanley-gardens, Kensington-park, W.*
1864	Bone, John William, Esq., B.A., F.R.S.L., F.S.S. 26, *Bedford-place, Russell-square, W.C.*
1861	Bonney, Charles, Esq. *Adelaide, Australia.*
1858	Bonnor, George, Esq. 49, *Pall-mall, S.W.; and* 2, *Bayswater-terr., Kensington-square, W.*
1865	Bonwick, James, Esq. *St. Kilda, Melbourne. Care of W. Beddow, Esq.*, 22, *South Audley-street, W.*
1866	Booker, Wm. Lane, Esq. *Care of Messrs. F. O'Brien and Co.*, 43, *Parliament-street, S.W.*
1859	Borough, Sir Edward, Bart. 4, *Nassau-street, Dublin.*
1845	*Borrer, Dawson, Esq. *Altmont Ballon, Co. Carlow, Ireland.*
1856	*Botcherby, Blackett, Esq., M.A. 174, *Brompton-road, S.W.*
1858	240*Botterill, John, Esq. *Flower-bank, Burley-road, Leeds.*
1871	Bourne, John, Esq., C.E. 21, *Richmond-road, Bayswater, W.*

Year of Election.	
1860	Boustead, John, Esq. 34, *Craven-street, Strand, W.C.*
1866	*Boutcher, Emanuel, Esq. 12, *Oxford-square, Hyde-park, W.*
1865	Bouverie, P. P., Esq. 32, *Hill-street, Berkeley-square, W.*
1867	Bowell, Wm., Esq. *Chandos-house, Hereford; and Gate-house Grammar-school, Hereford.*
1861	*Bowen, Charles Christopher, Esq. *Christchurch, Canterbury, New Zealand. Care of A. O. Ottywell, Esq., 7, Westminster-chambers, S.W.*
1854	*Bowen, Sir George Ferguson, K.C.M.G., M.A., *Governor of New Zealand.*
1871	Bowes, John, Esq. *Warrington, Lancashire.*
1862	Bowie, John, Esq. *Conservative Club, S.W.*
1869	250 Bowker, James Henry, Esq. *Basutoland, South Africa. Care of Messrs. King and Co., Cornhill, E.C.*
1868	Bowly, William, Esq. *Cirencester.*
1856	Bowman, John, Esq. 9, *King William-street, E.C.*
1869	Bowra, E. C., Esq., Commissioner of Maritime Customs. *Ningpo, China.*
1865	Bowring, John Charles, Esq. *Larkbeore, Exeter.*
1866	Bowring, Samuel, Esq. 1, *Westbourne-park, W.*
1868	Bowser, Alfred T., Esq. *Cromwell-house, Hackney, E.*
1862	Boyce, Rev. W. B., Secretary to Wesleyan Missionary Society. *Wesleyan Mission House, Bishopsgate-street, E.C.*
1845	*Boyd, Edward Lennox, Esq., F.S.A. 35, *Cleveland-square, Hyde-park, W.*
1869	Boyle, Richard Vicars, Esq., C.S.I., &c. 9, *Stanhope-place, Hyde-park, W.*
1856	260 Boyne, G. Hamilton-Russell, Viscount. 22, *Belgrave-square, S.W.: Brancepeth-castle, Durham; and Burwarton-hall, Ludlow, Salop.*
1851	Bracebridge, Charles Holte, Esq. *Atherstone, Warwick.*
1870	*Bragge, William, Esq., C.E. *Shirle's-hill, Sheffield.*
1870	Braim, The Ven. the Archdeacon. *The Rectory, Bishop's Caundle, Sherborne, Dorset.*
1862	Braithwaite, Isaac, Esq. 27, *Austin-friars, E.C.*
1863	*Bramley-Moore, John, Esq. *Langley-lodge, Gerrard's-cross, Bucks.*
1859	*Brand, James, Esq. 109, *Fenchurch-street, E.C.*
1868	Brand, James Ainsworth, Esq. 100, *Cannon-street, E.C.*
1867	Brandis, Dr. D., F.L.S. *Director of Forests, Calcutta. Care of W. H. Allen, Esq., 13, Waterloo-place, S.W.*
1859	Braybrooke, Philip Watson. *Assistant Colonial Secretary, Ceylon. Messrs. Price and Co., Craven-street, W.C.*
1861	270*Brenchley, Julius, Esq. *Oxford and Cambridge Club, S.W.; and Milgate, near Maidstone, Kent.*
1833	*Brereton, Rev. John, LL.D., F.S.A. *Bedford.*
1834	*Breton, Wm. Henry, Esq., Commr. R.N., M.R.I. 26, *Queen-square, Bath; and The Rectory, Charmouth, Dorset.*
1862	Brett, Charles, Esq.
1867	Bridge, John, Esq. *Altrincham, Cheshire.*
1858	Bridges, Nathaniel, Esq.

Year of Election	
1852	*Brierly, Oswald W., Esq. 8, *Lidlington-place, Harrington-square, Hampstead-road, N.W.*
1865	Briggs, Colonel J. P. *Lantern Tower, Jedburgh.*
1861	*Bright, Sir Charles T., F.R.A.S. 6, *Westminster-chambers, Victoria-street, S.W.; and* 69, *Lancaster-gate, W.*
1868	Bright, Henry Arthur, Esq. *Ashfield, Knotty Ash, Liverpool.*
1860	280 Bright, James, Esq., M.D. 12, *Wellington-square, Cheltenham.*
1854	Brine, Major Frederic, R.E. K.T.S. A.I.C.E., Executive Engineer, Punjaub. *Athenæum Club, S.W.; Army and Navy Club, S.W.; Garrick Club, W.C.*
1856	Brine, Captain Lindesay, R.N. *Army and Navy Club, S.W.; All Saints' Rectory, Axminster. Care of Messrs. Woodhead.*
1861	Bristowe, Henry Fox, Esq.
1861	Broadwater, Robert, Esq. 3, *Billiter-square, Fenchurch-street, E.C.*
1861	Brodie, Walter, Esq. *Orsett-house, Orsett-terrace, Hyde-park, W.*
1861	Brodie, William, Esq. *Eastbourne, Sussex.*
1863	*Brodrick, The Hon. George C. 32A, *Mount-street, W.*
1864	*Brooke, Sir Victor A., Bart. *Colebrooke-park, Co. Fermanagh, Ireland.*
1872	Brookes, Clifford J., Esq. *Calcutta. Care of W. G. Thorpe, Esq.*, 1, *Riches-court, Lime-street, E.C.*
1862	290 Brookes, Thomas, Esq. *Mattock-lane, Ealing, W.*
1856	*Brooking, George Thomas, Esq. 33, *Sussex-gardens, Hyde-park, W.*
1856	*Brooking, Marmaduke Hart, Esq. 11, *Montagu-place, Bryanston-square, W.*
1870	*Brooks, Wm. Cunliffe, Esq., M.P., M.A., F.S.A., &c. 5, *Grosvenor-square, S.W.; Barlow-hall, near Manchester; and Forest of Glen-Tanar, Aboyne, Aberdeenshire.*
1863	*Broughall, William, Esq. *Broadwater, Down, Tunbridge-wells.*
1868	*Brown, Colonel David (Madras Staff Corps). *India.*
1856	*Brown, Daniel, Esq. *The Elms, Larkhall-rise, Clapham, S.*
1864	Brown, Edwin, Esq., F.G.S. *Burton-on-Trent.*
1867	Brown, Geo. H. Wilson, Esq. *Victoria, Vancouver Island, British Columbia. Care of H. C. Beeton, Esq.*, 5, *Bow-churchyard, E.C.*
1860	Brown, James, Esq. *Rossington, Yorkshire.*
1863	300 Brown, James P., Esq. *Cocaes, Brazil. Care of W. D. Thomson, Esq.*, 1, *Tyndale-place, Upper-street, Islington, N.*
1865	*Brown, James R., Esq., F.R.S.N.A. Copenhagen. 84, *Caversham-road, N.W.*
1861	*Brown, John Allen, Esq. *Surrey-lodge, Somerset-road, Ealing, W.*
1867	Brown, Richard, Esq., C.E. 115, *Lansdowne-road, Notting-hill, W.*
1867	Brown, Robert, Esq. 4, *Gladstone-terrace, Hope-park, Edinburgh.*
1856	*Brown, Samuel, Esq. 11, *Lombard-st., E.C.; and The Elms, Larkhall-rise, Clapham, S.*
1858	*Brown, Thomas, Esq. 8, *Hyde-park-terrace, Hyde-park, W.*
1859	Brown, William, Esq. *Loat's-road, Clapham-park, S.*
1863	Browne, H. H., Esq. *Moor-close, Binfield, Bracknell.*
1862	Browne, John Comber, Esq., Superintendent and Inspector of Government Schools. *Port Louis, Mauritius.*

Year of Election.	
1858	310*Browne, John H., Esq. *Montpellier-lawn, Cheltenham.*
1869	Browne, Samuel Woolcott, Esq. 58, *Porchester-terrace, Hyde-park, W.*
1864	*Browne, Captain Wade. 35, *Charles-street, Berkeley-square, W.*
1858	Browne, William J., Esq. *Marston-lodge, Pitville, Cheltenham.*
1870	Browne, Wm. A. Morgan, Esq. *Junior Athenæum Club, S.W.*
1852	Browning, H., Esq. 73, *Grosvenor-street, Grosvenor-square, W.; and Old Warden-park, Biggleswade.*
1856	*Browning, Thomas, Esq. 6, *Whitehall, S.W.*
1859	Bruce, Rt. Hon. Henry Austin, M.P. 1, *Queen's-gate, S.W.; and Duffryn, Aberdare, Glamorganshire.*
1863	Brunton, John, Esq., M.I.C.E., F.G.S. *Care of Messrs. Willis and Sotheran, Charing-cross, S.W.;* 13A, *Great George-street, S.W.*
1856	Bryant, Walter, Esq., M.D., F.R.C.S. 7, *Bathurst-street, Hyde-park-gardens, W.*
1867	320*Buccleuch, His Grace the Duke of, K.G., F.R.S. *Dalkeith Palace, near Edinburgh; and Montagu-house, Whitehall, S.W.*
1869	Buckley, John, Esq. *Care of Messrs. Dalgety, Du Croz, and Co.*, 52, *Lombard-street, E.C.*
1863	Budd, J. Palmer, Esq. *Care of J. J. Milford, Esq.*, 13, *Austin-friars, E.C.*
1867	*Bulger, Major George Ernest, F.L.S., &c. *Care of Mr. Booth*, 307, *Regent-st., W.*
1868	*Bull, William, Esq., F.L.S. *King's-road, Chelsea, S.W.*
1865	Buller, Sir Edward M., Bart., M.P. *Old Palace-yard, S.W.; and Dilhorn-hall, Cheadle, Staffordshire.*
1869	Buller, Walter L., Esq., F.L.S. *Wanganui, New Zealand. Care of Mr. J. Van Voorst*, 1, *Paternoster-row, E.C.*
1863	Bullock, Commander Charles J., R.N. *Hydrographic-office, S.W.*
1830	*Bullock, Rear-Admiral Frederick. *Woolwich, S.E.*
1864	Bullock, W. H., Esq. *Grosvenor-hill, Wimbledon, S.W.*
1860	330*Bunbury, Sir Charles James Fox, Bart., F.R.S. *Barton-hall, Bury St. Edmund's.*
1839	Bunbury, E. H., Esq., M.A. 35, *St. James's-street, S.W.*
1863	Bundock, F., Esq. *Windham Club, S.W.*
1861	Burges, William, Esq. *Fethard, Co. Tipperary.*
1866	*Burgess, James, Esq., M.R.A.S., Hon. Sec. Bombay Geogr. Soc., Principal of Sir J. Jejeebhoy's Parsee B. Institution. *Hornby-row, Bombay. Care of J. McGlashan, Esq.*, 31, *Essex-street, Strand, W.C.*
1871	*Burke, Samuel Constantine, Esq. 84, *Harbour-street, Kingston, Jamaica.*
1864	Burn, Robert, Esq. 5, *Clifton-place, Sussex-square, W.*
1871	Burney, Commr. Chas., R.N., *Superintendent Greenwich Hospital Schools, S.E.*
1863	*Burns, John, Esq. 1, *Park-gardens, Glasgow; and Castle Wemyss, by Greenock, N.B.*
1861	*Burr, Higford, Esq. 23, *Eaton-place, S.W.; and Aldermaston-court, Berkshire.*
1857	340 Burstal, Captain E., R.N. 9, *Park-villas, Lower Norwood, S.*
1830	*Burton, Alfred, Esq. 64, *Marina, St. Leonard's.*
1833	*Burton, Decimus, Esq., F.R.S. 37, *Gloucester-gardens, Hyde-park, W.*
1859	*Burton, Capt. Richd. Fras., 18th Regt. Bombay N.I.; 14, *St. James's-square, S.W. Care of F. Arundell, Esq., Admiralty, Somerset-house, W.C.*

Year of Election.		
1869		Burton, William Samuel, Esq. *South-villa, Regent's-park, N.W.*
1858		Bury, William Coutts, Viscount. 48, *Rutland-gate, S.W.*
1861		Bush, Rev. Robert Wheler, M.A. 1, *Milner-square, Islington, N.*
1868		Busk, William, Esq., M.C.P., &c. 28, *Bessborough-gardens, S.W.*
1861		Butler, Charles, Esq. 3, *Connaught-place, Hyde-park, W.*
1871		Butler, W. F., Esq., Lieut. 69th Regiment. *Chatham.*
1867	350	Butler, E. Dundas, Esq. *Geographical Department, British Museum, W.C.*
1860		*Butler, Rev. Thomas. *Rector of Langar, Nottinghamshire.*
1870		Butter, Donald, Esq., M.D., &c. *Hazelwood-church-road, Upper Norwood, S.E.*
1870		Buxton, Francis W., Esq., B.A. 23, *Upper Brook-street, W.*
1869,		Buxton, Henry Edmund, Esq., B.A. *Bank-house, Great Yarmouth, Norfolk.*
1858		*Buxton, Sir Thomas Fowell, Bart. 23, *Upper Brook-street, W.; and Brick-lane, N.E.*
1866		Byass, Robert B., Esq. *Melville-park, Tunbridge-wells.*
1864		Bythesea, Captain J., R.N., V.C. 20, *Grosvenor-place, Bath.*
1830		*Cabbell, B. B., Esq., M.A., F.R.S., F.S.A. 1, *Brick-court, Temple, E.C.*; 52, *Portland-place, W.; and Aldwick, Sussex.*
1866		Caldbeck, Captain J. B. (P. and O. Sup. at Aden). 17, *West Mall, Clifton; and* 122, *Leadenhall-street, E.C. Care of Mrs. Caldbeck, Brownswood-house, Ennis-road, Hornsey, N.*
1861	360	Calthorpe, The Hon. Augustus Gough. 33, *Grosvenor-square, W.*
1855		*Calthorpe, F. H. Gough, Lord. 33, *Grosvenor-square, W.*
1854		Calvert, Frederic, Esq., Q.C. 38, *Upper Grosvenor-street, W.*
1871		*Cama, Dorabjee Pestronjee, Esq. 42, *Russell-road, Kensington, W.; and* 3 *and* 4, *Winchester-street-buildings.*
1861		Cameron, Donald, Esq., M.P. *Auchnacarry, Inverness-shire.*
1858		Cameron, Major-General Sir Duncan Alexander, R.E., C.B. *New Zealand.*
1864		Cameron, J., Esq. *Singapore.*
1866		Cameron, R. W., Esq. *Staten Island, New York. Care of Messrs. Brooks and Co., St. Peter's-chambers, Cornhill, E.C.*
1871		Campbell, Allan, Esq. 35, *St. James's-place, S.W.*
1861		Campbell, Rear-Admiral Frederick, R.N. *H.M.S. 'Agincourt.'*
1866	370	Campbell, George, Esq., D.C.L., Lieut.-Governor of Bengal; *and Athenæum Club, S.W.*
1844		*Campbell, James, Esq. *Grove-house, Hendon, Middlesex; and* 37, *Seymour-street, W.*
1857		Campbell, James, Esq., Surgeon R.N. *Bangkok, Siam. Care of Messrs. H. S. King and Co.*
1834		*Campbell, James, Esq., jun. *Hampton-court-green, S.W.*
1863		*Campbell, James Duncan, Esq. *Peking. Care of H. C. Batchelor, Esq.*, 155, *Cannon-street, E.C.*
1869		Campbell, Robert, Esq., J.P. 31, *Lowndes-square, S.W.; and Buscot-park, Lechlade, Gloucestershire.*

Year of Election.		
1871		Campos, Dr. J. B. Gonsalvez. *Maranham, Brazil.*
1866		Canning, Sir Samuel, C.E. *The Manor-house, Abbots Langley, near Watford, Herts.*
1864		Cannon, John Wm., Esq. *Castle-grove, Tuam.*
1857		Cannon, Lieut.-General R. 5, *Park-villas, Folkestone.*
1853	380	*Cardwell, Right Hon. Edward, M.P. 74, *Eaton-square, S.W.*
1863		*Carew. R. Russell, Esq., J.P. *Carpenders-park, Watford, Herts; and Oriental Club, W.*
1869		Carey, Rev. Tupper. *Fifield, Bavant, Salisbury; and* 15, *Hyde-park-gardens, W.*
1862		Cargill, John, Esq., Member of the Legislative Assembly of New Zealand and Legislative Council of Otago. *Dunedin, Otago, New Zealand.*
1863		*Cargill, Wm. W., Esq. 4, *Connaught-place, Hyde-park, W.*
1870		Carleton, Colonel Dudley. 42, *Berkeley-square, W.*
1864		*Carmichael, L. M., Esq., M.A., 5th Lancers. *Oxford and Cambridge Club, S.W.*
1865		*Carnegie, David, Esq. *Eastbury, by Watford, Herts.*
1863		Carnegie, Commander the Hon. J., R.N. 26, *Pall-mall, S.W.*
1869		Carr, William, Esq. *Dene-park, near Tunbridge.*
1861	390	Carter, Captain Hugh Bonham, Coldstream Guards. *Guards' Club, S.W.; and* 1, *Carlisle-place, Victoria-street, S.W.*
1868		Carter, Thomas Tupper, Captain, R.E. *Care of Messrs. H. S. King and Co.,* 45, *Pall-mall.*
1857		Cartwright, Col. Henry, Grenadier Guards, M.P. 1, *Tilney-street, Park-street, Grosvenor-square, W.*
1860		*Carver, Rev. Alfred J., D.D., Master of Dulwich College. *Dulwich, S.E.*
1869		Casberd-Boteler, Commr. W. J., R.N. *Higham-hill, Walthamstow.*
1858		Casella, Louis P., Esq. 147, *Holborn, E.C.; and South-grove, Highgate, N.*
1860		Cave, Amos, Esq. 109, *New-road, Kennington-park, S.; and Rathbone-place, Oxford-street, W.*
1857		Cave, Captain Laurence Trent. 75, *Chester-square, W.*
1858		Cave, Right Hon. Stephen, M.P. 35, *Wilton-place, S.W.*
1869		Cayley, Dr. Henry. 58, *Welbeck-street, Cavendish-square, W.*
1863	400	Challis, John Henry, Esq. *Reform Club, S.W.*
1865		Chambers, Charles Harcourt, Esq., M.A. 2, *Chesham-place, S.W.*
1872		Chambers, Geo. Fredk., Esq., 45th Regiment. *Aldershot.*
1858		Champion, John Francis, Esq. *High-street, Shrewsbury.*
1866		*Chandless, William, Esq., B.A. 1, *Gloucester-place, Portman-square, W.*
1870		Chapman, E. F., Esq., Lt. R.A. *The Grove, Tunbridge.*
1867		Chapman, James, Esq. *Cape Town, Cape of Good Hope.*
1863		*Chapman, Spencer, Esq. *Roehampton, S.W.*
1870		Charles, Rev. David, M.A. *University College, Aberystwyth, South Wales.*
1861		Charnock, Richard Stephen, Esq., PH.DR., F.S.A. 8, *Gray's-inn-square, W.C.; and The Grove, Hammersmith.*
1864	410	Cheadle, Walter, Esq., B.A., M.D.Camb. 2, *Hyde-park-place, Cumberland-gate, W.*
1861		Cheetham, John Frederick, Esq. *Eastwood, Staleybridge.*

Year of Election.	
1855	Cheshire, Edward, Esq. 3, *Vanbrugh-park, Blackheath, S.E.; and Conservative Club, S.W.*
1858	Chetwode, Augustus L., Esq. 7, *Suffolk-street, Pall-mall-east, S.W.; and Chilton-house, Thame, Oxfordshire.*
1870	Chichester, Sir Bruce, Bart. *Arlington-court, Barnstaple.*
1858	Childers, Right Hon. Hugh C. E., M.P. 17, *Prince's-gardens, W.; and Australia.*
1856	Childers, John Walbanke, Esq. 13, *Queen-square; and Cantley-hall, near Doncaster.*
1857	*Chimmo, Commr. William, R.N. *H.M.S. 'Nassau.' Care of the Hydrographic-office, S.W.*
1869	Chinnock, Frederick George, Esq. 86, *Cornwall-gardens, Queen's-gate, W.*
1871	Church, Colonel Geo. Earl. 446, *Strand, W.C.*
1830	420*Church, W. H., Esq.
1849	Churchill, Lord Alfred Spencer. 16, *Rutland-gate, S.W.*
1856	Churchill, Charles, Esq. *Weybridge-park, Surrey.*
1869	Churchill, Henry A., Esq., H.M. Consul, Zanzibar. *Care of Messrs. King and Co.*, 45, *Pall-mall, S.W.*
1870	Clapton, Edward, Esq., M.D., &c. *St. Thomas's-street, Southwark, S.E.*
1863	Clark, Lieut. Alex. J. 14, *St. James's-square, S.W.; and Exeswell-house, Maindee, Newport, Monmouthshire.*
1870	Clark, Charles, Esq. 20, *Belmont-park, Lee, Kent, S.E.*
1866	Clark, J. Howarth, Esq. *Cheetham Collegiate-school, Manchester.*
1868	Clark, John Gilchrist, Esq. *Speddock, Dumfries, Dumfriesshire.*
1862	Clark, J. Latimer, Esq. 5, *Westminster-chambers, Victoria-street, S.W.; and Beechmont, Dulwich, S.E.*
1870	430 Clark, Robert, Esq. 46, *Chepstow-villas, Bayswater, W.*
1868	Clark, William, Esq. *The Cedars, South Norwood.*
1859	Clark, Rev. W. Geo., M.A. *Trinity College, Cambridge.*
1865	Clark, W. H., Esq. 6, *Leinster-terrace, Hyde-park, W.*
1859	Clarke, Captain A., R.E. *Army and Navy Club, S.W.*
1855	*Clarke, Rev. W. B., M.A. *St. Leonard's, Sydney, New South Wales. Care of Messrs. Richardson, Cornhill.*
1868	Clarke, W., Esq. 44, *Ladbroke-grove, W.*
1862	Claude, Eugène, Esq. *Villa Helvetia, Carlton-road, Tufnell-park, N.*
1842	*Clavering, Sir William Aloysius, Bart., M.A. *United University Club, S.W.; Axwell-park, near Gateshead; and Greencroft, Durham.*
1863	Clayton, Captain John W., late 15th Hussars. 14, *Portman-square, W.*
1866	440 Clayton, Sir W. R. *Harleyford, Great Marlow, Bucks.*
1866	*Cleghorn, Hugh, Esq., M.D. *Strathy, St. Andrew's.*
1871	Cleghorn, John, Esq., M.S.S., M.S.A., &c. 9, *Spring-gardens, S.W.*
1863	Clements, Rev. H. G. *United University Club, S.W.; and Sidmouth.*
1870	Clements, Robert George, Esq. 97, *Victoria-park-road, E.*
1860	Clerk, Captain Claude. *Military Prison, Aldershot, Hants.*
1858	Clermont, Thomas, Lord. *Ravensdale-park, Newry, Ireland.*

Year of Election.	
1845	*Cleveland, His Grace the Duke of. *Cleveland-house*, 17, *St. James's-square*, *S.W.*
1861	Clifford, Sir Charles. 2, *Savile-row*, *W.*; *and Campden-house*, *Broadway*, *Worcestershire.*
1858	Clifford, Charles Cavendish, Esq. *House of Lords*, *S.W.*
1871	450 Clifford, Henry, Esq., C.E. *Hamilton-villas*, *Hyde-vale*, *Greenwich*, *S.E.*
1866	Clinton, Lord Edward. *Army and Navy Club*, *S.W.*
1865	Clipperton, Robert Charles, Esq., H.B.M. Consul, Nantes.
1856	Clive, Rev. Archer. *Whitfield*, *Hereford.*
1863	Clowes, E., Esq. *Salisbury-square*, *Fleet-street*, *E.C.*
1854	Clowes, George, Esq. *Duke-street*, *Stamford-street*, *Blackfriars*, *S.E.*; *Charing-cross*, *S.W.*; *and Surbiton*, *Surrey.*
1854	Clowes, William, Esq. *Duke-street*, *Stamford-street*, *Blackfriars*, *S.E.*; *Charing-cross*, *S.W.*; *and* 51, *Gloucester-terrace*, *Hyde-park*, *W.*
1861	Clowes, William Charles Knight, Esq., M.A. *Duke-street*, *Stamford-street*, *Blackfriars*, *S.E.*; *and Surbiton*, *Surrey.*
1852	Cobbold, John Chevalier, Esq. *Athenæum Club*, *S.W.*; *and Ipswich*, *Suffolk.*
1859	Cochrane, Rear-Admiral the Hon. A., C.B. *Junior United Service Club*, *S.W.*
1868	460 Cock, Edward, Esq. *Kingston-on-Thames.*
1869	*Cockburn, Captain James George. (*Rawul Pindee*, *Bengal.*) *Care of Colonel Cockburn*, *Bracon Ash*, *Norwich.*
1862	Cockerton, Richard, Esq. *Cornwall-gardens*, *South Kensington*, *W.*
1862	*Cockle, Captain George. 9, *Bolton-gardens*, *South Kensington*, *W.*
1859	Cocks, Colonel C. Lygon (Coldstream Guards). *Crediton*, *Devon.*
1865	Cocks, Major Octavius Yorke. 180, *Piccadilly*, *W.*
1841	*Cocks, Reginald Thistlethwayte, Esq. 43, *Charing-cross*, *S.W.*; *and* 22, *Hertford-street*, *Mayfair*, *W.*
1871	*Cockshott, Arthur, Esq., M.A., *Eton College.*
1857	Coghlan, Edward, Esq. *Training-institution*, *Gray's-inn-road*, *W.C.*
1861	Coghlan, J., Esq., Engr.-in-Chief to the Government. *Buenos Ayres.* *Care of Messrs. J. Fair and Co.*, 4, *East India-avenue*, *Leadenhall-street*, *E.C.*
1862	470 Coghlan, Major-Gen. Sir William M., K.C.B., R.A. *Ramsgate*, *Kent.*
1865	Colchester, Reginald Charles Edward, Lord. *All Souls' College*, *Oxford.*
1868	Cole, William H., Esq. 64, *Portland-place*, *W.*
1867	Colebrook, John, Esq. 15, *Hans-place*, *Chelsea*, *S.W.*
1841	*Colebrooke, Sir Thomas Edward, Bart., F.R.A.S. 37, *South-st.*, *Park-lane*, *W.*
1854	Coleman, Everard Home, Esq., F.R.A.S. *Registry and Record Office*, *Adelaide-place*, *London-bridge*, *E.C.*
1848	Coles, Charles, jun., Esq. 86, *Great Tower-street*, *E.C.*
1835	*Collett, William Rickford, Esq. *Carnarvon*; *and Carlton Club*, *S.W.*
1867	Collier, C. T., Esq., Barrister of the Middle Temple. *Cedar-villa*, *Sutton*, *Surrey*; *and Oriental Club*, *W.*
1872	Collingwood, Lieut. W. *India Office*, *S.W.*
1858	480 Collinson, Henry, Esq. 7, *Devonshire-place*, *Portland-place*, *W.*
1866	Collinson, John, Esq., C.E. 37, *Porchester-terrace*, *Hyde-park*, *W.*

Year of Election.	
1855	Collinson, Vice-Admiral Richard, C.B. *Haven-lodge, Ealing, W.; and United Service Club, S.W.*
1862	Colquhoun, Sir Patrick M. de, Q.C., LL.D. 2, *King's-bench-walk, Temple, E.C.*
1869	Colvill, William H., Esq., Surg. H.M. Ind. Army. *Lawn-bank, Hampstead; and Baghdad.*
1861	*Colville, Charles John, Lord. 42, *Eaton-place, S.W.*
1865	Colvin, Binney J., Esq. 71, *Old Broad-street, E.C.*
1868	Colvin, Captain W. B., Royal Fusiliers. *Care of Messrs. Cox and Co., Craig's-court, S.W.*
1868	Combe, Lieut. B. A.
1861	Combe, Thomas, Esq., M.A. *University Press, Oxford.*
1871	490 Comber, Major, A. K. (Dep.-Commd. of Assam). 12, *Norfolk-terrace, Brighton.*
1864	Commerell, Commr. J. E., R.N., V.C.
1864	Conder, John, Esq. *Hallbrooke-house, New Wandsworth, S.W.*
1868	Coney, Rev. T., M.A. *Chaplain to the Forces, Chatham.*
1861	Constable, Captain Chas. Golding, I.N. 6, *Harley-road, St. John's-wood, N.W.*
1872	Cook, F. L., Esq. 3, *Cromwell-place, South Kensington.*
1868	Cook, H. Esq., M.D., &c. *Care of Messrs. Forbes and Co.*, 12, *Leadenhall-st., E.C.*
1871	Cook, Henry, Esq. *Grammar-school, Wantage, Berks.*
1859	Cooke, Lieut.-Col. A. C., R.E. *Bermuda.*
1863	*Cooke, E. W., Esq., A.R.A., F.R.S., F.L.S., F.Z.S., F.G.S., Accad. Bell. Art. Venet. et Holm. Socius. *Glen-Andred, Groombridge, Sussex; and Athenæum Club, S.W.*
1856	500 Cooke, John George, Esq. 18, *Pelham-place, Brompton, S.W.*
1860	Cooke, Nathaniel, Esq. 5, *Ladbroke-terrace, Notting-hill, W.*
1852	Cooke, Robt. F., Esq. 50, *Albemarle-street, W.*
1860	Cooke, William Henry, Esq., Barrister-at-Law. 4, *Elm-court, Temple, E.C.*
1830	Cooley, William Desborough, Esq. 13, *College-place, Camden-town, N.W.*
1872	Cooper, Commr. B. J. *Mouart, Torquay.*
1862	Cooper, Sir Daniel. 20, *Prince's-gardens, South Kensington, S.W.*
1856	Cooper, Lieut.-Col. Edward, Grenadier Guards. 5, *Bryanston-square, W.*
1860	Cooper, Lieut.-Col. Joshua H., 7th Fusiliers. *Dunboden, Mullingar.*
1857	*Coote, Captain Robert, R.N. *Shales, Bittern, Southampton.*
1872	510 Cope, Charles Rogers, Esq. *Edgbaston, Warwick.*
1871	Cope, Henry, Esq. 18, *Montagu-street, Russell-square, W.*
1853	Copley, Sir Joseph William, Bart. *Sprotborough, Doncaster.*
1864	Cork and Orrery, Earl of. 1, *Grafton-street, W.*
1868	Cork, Nathaniel, Esq. *Ivy-lodge*, 9, *Warwick-road, Upper Clapton, N.E.*
1868	Corner, William M., Esq. *Cobden-house, Leytonstone; and* 104, *Leadenhall-street, E.C.*
1868	*Cornish-Brown, Charles, Esq. 7, *Lansdowne-place, Clifton, Bristol.*
1865	Cornthwaite, Rev. T., M.A. *Forest, Walthamstow.*
1860	Cornwell, James, Esq., PH. DR. *Purbrook, Crescent-wood-rd., Sydenham-hill, S.E.*
1839	*Cornwallis, Frederick, Esq. *Parkham-hall, Wickham Market, Suffolk.*

Year of Election.	
1870	520 Corrie, John, Esq. 42, *Lancaster-gate, Hyde-park, W.*
1868	Cory, Frederic C., Esq., M.D. *Portland-villa, Buckhurst-hill, Essex; and Nassau-place, Commercial-road, E.*
1869	Coster, Guillaume F., Esq. 11, *Park-crescent, Regent's-park, N.W.*
1853	*Cosway, William Halliday, Esq. *Oxford and Cambridge Club, S.W.*
1863	Courtenay, L. W., Esq. *British Post-office, Constantinople. Care of R. Wood, Esq.*, 139, *Fleet-street.*
1865	Cowan, John E., Esq. 58, *Denbigh-street, S.W.*
1862	Coward, William, Esq. *Rock Bank, Lordship-lane, Dulwich, S.E*
1857	*Cowell, Lieut.-Col. Sir J. C., K.C.B., R.E. *Buckingham-palace, S.W.*
1854	Cowley, Norman, Esq. 4, *Montagu-place, Montagu-square, W.*
1871	Cowper, Charles, Esq., C.M.G. 3, *Westminster-chambers, S.W.*
1871	530 Cowper, Henry Aug. (H.M. Com. Puerto Rico). *Care of Messrs. Woodhead*, 44, *Charing-cross, S.W.*
1862	*Cowper, Sedgwick S., Esq. 3, *Upper Phillimore-place, West Kensington.*
1865	Coysh, John S., Esq. *Levant-house, St. Helen's-place, E.C.*
1870	*Cracroft, Bernard, Esq., M.A. Trin. Coll. Camb. *Oxford and Cambridge Club, S.W.; and* 8, *Savile-row, S.W.*
1867	Crane, Leonard, Esq., M.D. 7, *Albemarle-street, W.*
1857	Craufurd, Lieut.-General James Robertson, Grenadier Guards. *Travellers' Club, S.W.; and* 36, *Prince's-gardens, W.*
1848	Crawford, Robert Wigram, Esq., M.P. 71, *Old Broad-street, E.C.*
1866	Crawfurd, O. J., Esq. *Athenæum Club, S.W.*
1861	Creswell, Rev. Samuel Francis, B.D., F.R.A.S. *Principal of the High School, Dublin.*
1859	*Creyke, Captain Richard Boynton, R.N. *Ulverstone, Lancashire.*
1856	540 Croker, T. F. Dillon, Esq. 19, *Pelham-place, Brompton, S.W.*
1864	Croll, A. A., Esq., C.E. *Southwood, Southwood-lane, Highgate.*
1868	Croll, Alex., Esq. *Mavis Bank, Grange-road, Upper Norwood.*
1860	*Croskey, J. Rodney, Esq.
1860	Crosse, Rev. Thomas, D.C.L., M.R.A.S. *Hastings.*
1862	Crossman, James Hiscutt, Esq. *Rolls-park, Chigwell, Essex.*
1863	*Crowder, Thos. Mosley, Esq., M.A. *Thornton-hall, Bedale, Yorkshire.*
1852	Crowdy, James, Esq. 17, *Serjeants'-inn, E.C.*
1871	Cubitt, Joseph, Esq., C.E. 7, *Park-street, S.W.*
1859	Cull, Richard, Esq., F.S.A. 13, *Tavistock-street, Bedford-square, W.C.*
1857	550 Cumming, William Fullarton, Esq., M.D. *Athenæum Club, S.W.; and Kinellan, Edinburgh.*
1860	Cunliffe, Roger, Esq. 24, *Lombard-street, E.C.; and* 10, *Queen's-gate, South Kensington, W.*
1853	Cunningham, John Wm., Esq., Sec. King's College. *Somerset-house, W.C.; and Harrow, N.W.*
1862	*Cunynghame, Major-Gen. A. T., C.B. *Mount Dillon, Dundrum, Co. Dublin.*
1870	Cunynghame, Sir Edward A., Bart. *Army and Navy Club, S.W.*

Year of Election		
1865		Cure, Capel, Esq. 51, *Grosvenor-street, W.*
1868		Currie, A. A. Hay, Esq., C.E. *The Manor-house, Tunbridge-wells.*
1843		*Cursetjee, Manockjee, Esq., F.R.S.N.A. *Villa-Byculla, Bombay.*
1839		*Curtis, Timothy, Esq.
1857		Cuttance, John Fras. J., Esq. *Cleveland-house, Greville-road, Kilburn, N.W.*
1863	560	*Dalgety, Fred. G., Esq. 16, *Hyde-park-terrace, W.*
1864		Dallas, A. G., Esq. 36, *Beaufort-gardens, W.*
1870		Dallas, Geo. E., Esq. *Foreign-office, S.W.*
1865		D'Almeida, W. B., Esq. 19, *Green-park, Bath.*
1863		Dalrymple, Donald, Esq. *Thorpe-lodge, Norwich.*
1867		Dalrymple, Geo. Elphinstone, Esq. *Logie, Elphinstone, Aberdeenshire.*
1868		Dalrymple, R. G. E., Esq.
1857		Dalton, D. Foster Grant, Esq. *Shanks-house, near Wincanton, Somerset.*
1859		Dalyell, Sir Robt. Alex. Osborn, Bart. *H.M.'s Consul at Rustchuk, Bulgaria; and 120, Belgrave-road, S.W.*
1868		Dalziel, William R., Esq. 5, *Gresham-park, Brixton, S.*
1866	570	Damer, Lieut.-Col. Lionel S. Dawson. 2, *Chapel-street, Grosvenor-square, W.*
1838		*Darwin, Charles, Esq., M.A., F.R.S. 6, *Queen Anne-street, Cavendish-square, W.*
1860		Dasent, John Bury, Esq. 22, *Warwick-road, Maida-hill, W.*
1863		Davies, R. H., Esq. Chief Commissioner of Oudh, Lucknow. *Care of Messrs. Twining, 215, Strand, W.C.*
1869		*Davies, Robert E., Esq., J.P. *Crescent-villa, Kingston, near Portsmouth.*
1866		Davis, Edmund F., Esq. 6, *Cork-street, Bond-street, W.*
1866		Davis, Frederick E., Esq. 20, *Blandford-square, N.W.*
1868		Davis, Richard, Esq. 9, *St. Helen's-place, E.C.*
1861		Davis, Staff-Commander John Edward, R.N. *Hydrographic-office, Admiralty, S.W.*
1846		Davis, Sir John Francis, Bart., K.C.B., F.R.S., F.R.S.N.A. *Athenæum Club, S.W.; and Hollywood, near Bristol.*
1840	580	*Dawnay, The Hon. Payan. *Beningborough-hall, Newton-upon-Ouse, Yorkshire.*
1870		Dawson, John Edward, Esq. *Oak-lodge, Watford, Herts.*
1865		Debary, Rev. Thomas, M.A. 35, *Mount-street, W.*
1866		Debenham, William, Esq. 16, *Gloucester-place, Portman-square, W.*
1856		De Crespigny, Lieut. C., R.N.
1865		De Laski, A., Esq.
1869		De Leon, Dr. Hananel. 26, *Redcliffe-gardens, West Brompton, S.W.*
1868		Dell, William, Esq. *Messrs. Combe, Delafield, and Co., Long-acre.*
1862		Denham, Adm. Sir Henry Mangles, K.C.B., F.R.S. 21, *Carlton-road, Maida-vale, W.*
1860		Denison, Alfred, Esq. 6, *Albemarle-street, W.*
1870	590	Dennis, Colonel Shuckburgh. 30, *Duke-street, St. James's, S.W.*

Year of Election.		
1872		Dent, Edward, Esq. 12, *Hyde-park-gardens*, W.
1870		Dentry, J., Esq. *Crescent School, Margate.*
1871		Dentry, James, Esq. *The College, Margate.*
1853		*Derby, Edward Henry, Earl of, P.C., LL.D., D.C.L. 23, *St. James's-square, S. W.; and Knowsley-park, Prescott, Lancashire.*
1867		De Salis, Major-Gen. Rodolph, C.B. 123, *Pall-mall, S. W.*
1853		De Wesselow, Lieut. Fras. G. Simpkinson.
1854		*Devaux, Alexander, Esq. 2, *Avenue-road, Regent's-park, N. W.*
1837		*Devonshire, William Cavendish, Duke of, LL.D., D.C.L., M.A., F.R.S. *Devonshire-house, Piccadilly, W.; and Hardwicke-hall, Derbyshire.*
1872		Dhuleep-Singh, His Highness the Maharaja. *Elveden-hall, near Thetford.*
1870	600	Dibdin, Charles, Esq. 62, *Torrington-square, W.C.*
1870		Dibdin, Robert W., Esq. 62, *Torrington-square, W.C.*
1864		Dick, A. H., Esq., M.A., LL.B. *Free Church Normal College, Glasgow.*
1862		Dick, Captain Charles Cramond. *Elmwood, Colyford, Axminster, Devon.*
1866		*Dick, Fitzwilliam, Esq., M.P. 20, *Curzon-street, Mayfair, W.*
1861		Dick, Robert Kerr, Esq., Bengal Civil Service. *Oriental Club, W.*
1866		Dick, William Graeme, Esq. 29, *Leinster-square, W.*
1854		*Dickinson, Sebastian Stewart, Esq., M.P., Barrister-at-Law. 16, *Queen's-gate-terrace, W.; and Brown's-hall, Stroud, Gloucestershire.*
1830		*Dickinson, Francis Henry, Esq., F.S.A. 119, *St. George's-square, Pimlico, W.; and Kingweston-park, Somerset.*
1852		Dickinson, John, Esq., jun. *Athenæum Club, S. W.*
1859	610	Dickson, A. Benson, Esq. 4, *New-square, Lincoln's-inn, W.C.*
1860		Dietz, Bernard, Esq., of Algoa Bay. 3, *Dorset-square, W.*
1859		Digby, G. Wingfield, Esq. *Sherborne-castle, Dorset.*
1860		Digby, Lieut.-Col. John Almerus. *Chalmington-house, Cattstock, Dorchester.*
1869		Digby, Kenelm T., Esq., M.P. *Shaftesbury-house, Kensington, S. W.*
1859		*Dilke, Sir Charles Wentworth, Bart., M.P. 76, *Sloane-street, S. W.*
1856		Dillon, The Hon. Arthur. 17, *Clarges-street, W.*
1864		Dimsdale, J. C., Esq. 50, *Cornhill, E.C.; and* 52, *Cleveland-square, S. W.*
1867		Dix, Thomas, Esq. 10, *Amwell-street, W.C.*
1861		Dixon, Lieut.-Colonel John. 18, *Seymour-street, Portman-square.*
1854	620	Dixon, W. Hepworth, Esq., F.S.A. 6, *St. James's-terrace, Regent's-park, N. W.*
1857		Dobie, Robert, Esq., M.D., R.N. 7, *Houghton-place, Ampthill-square, Hampstead-road, N. W.*
1854		Dodson, John George, Esq., M.P. 6, *Seamore-place, Mayfair, W.*
1854		Domville, William T., Esq., M.D., R.N. *Army and Navy Club, S. W.; and Naval Dockyard, Malta.*
1867		Donald, James, Esq. 5, *Duke-street, York-place, Edinburgh.*
1858		Donne, John, Esq. *Instow, North Devon.*
1864		Doran, Dr. John, F.S.A. 33, *Lansdowne-road, Notting-hill, W.*
1868		Douglas, James A., Esq. *The Grange, Coulsdon, near Caterham.*
1868		Douglas, John, Esq. *Angas-lodge, Portsea.*

Year of Election.	
1870	Douglas, John, Esq. 32, *Charing-cross, S.W.*
1868	630 Douglas, Captain N. D. C. F. *Guards' Club, S.W.*
1871	Douglas, Stewart, Esq. 5, *Chester-terrace, Eaton-square, S.W.*
1871	Down, J. H. Langdon, Esq., M.D. 39, *Welbeck-street, W.; and Normansfield, Hampton Wick.*
1853	Doyle, Sir Francis Hastings C., Bart. *Custom-house, E.C.*
1845	*Drach, Solomon Moses, Esq., F.R.A.S. 39, *Howland-street, Fitzroy-square, W.*
1869	Drake, Francis, Esq., F.G.S.
1869	Drummond, Alfred Manners, Esq. *Charing-cross, S.W.*
1865	Drummond, E. A., Esq. 2, *Bryanston-square, W.*
1846	Drummond, Lieut.-General John. *The Boyce, Dymock, Gloucestershire.*
1846	Drury, Captain Byron, R.N. *The United Service Club, S.W.*
1851	640*Du Cane, Major Francis, R.E. *Brentwood, Essex.*
1851	*Ducie, Henry John, Earl of, F.R.S. 16, *Portman-square, S.W.*
1859	Duckworth, Henry, Esq. *Holmfield-house, Aughurth, near Liverpool.*
1860	*Duff, Mountstuart Elphinstone Grant, Esq., M.P. 4, *Queen's-gate-gardens, South Kensington, W.*
1868	Duff, Wm. Pirie, Esq. *Calcutta. Care of Messrs. John Watson and Co., 34, Fenchurch-street, E.C.*
1857	*Dufferin, Right Hon. Fredk. Temple Hamilton-Blackwood, Earl of, K.P., K.C.B., F.R.S. 8, *Grosvenor-square, and Dufferin-lodge, Fitzroy-park, Highgate, N.*
1866	*Dugdale, Captain Henry Charles G. *Merevale-hall, Atherstone, Warwick.*
1867	*Dugdale, John, Esq. 1, *Hyde-park-gardens; and Llwyn, Llanfyllin, Oswestry.*
1868	Dunbar, John Samuel A., Esq. 28, *Pembridge-crescent, Bayswater, W.; and 4, Barnard's-inn, Holborn.*
1863	Duncan, Capt. Francis, R.A., M.A., F.R.S. 32, *The Common, Woolwich, S.E.*
1861	650*Duncan, George, Esq. 45, *Gordon-square, W.C.*
1840	*Dundas, Right Hon. Sir David, Q.C. 13, *King's-Bench-walk, Temple, E.C.; and Ochtertyre, Stirling.*
1860	Dunell, Henry James, Esq. 12, *Hyde-park-square, W.*
1859	*Dunlop, R. H. Wallace, Esq., C.B., Indian Civil Service. *Northwood, near Rickmansworth, Herts.*
1860	*Dunmore, Charles Adolphus Murray, Earl of. 50, *Portman-place, W.*
1868	Dunn, Captain F. J. A. *Portillon, Tours, France; and 4, Cumbrian-grove, Gravesend, E.C.*
1867	Dunraven, Wyndham Thos., Earl of. *Clearwell-court, Coleford, Gloucestershire.*
1856	Duprat, Le Vicomte. *Consul-Général de Portugal, 43, Palace-gardens-terrace, Kensington, W.*
1869	Durham, Edward, Esq., *Beauchamp-house, Kilworth, near Leicester.*
1852	D'Urban, Major-Gen. W. J. *U. S. Club, S.W.; and Newport, near Exeter.*
1865	660*Dutton, F. S., Esq. *Reform Club, S.W.; and Adelaide, Australia.*
1868	Dutton, Frederick H., Esq. 45, *Dover-street, W.*
1870	Dymes, Daniel David, Esq., *Windham Club, S.W.; and 9, Mincing-lane, E.C.*

Year of Election.	
1867	Eadie, Robert, Esq.
1854	Eardley-Wilmot, Captain A. P., R.N., C.B. *Deptford Dockyard, E.*
1856	Eardley-Wilmot, Major-Gen. F., M.R.A. 22, *Victoria-rd., Clapham-common, S.W.*
1871	Earle, Arthur, Esq. *Childwall-lodge, Wavertree, near Liverpool; and Wind-ham Club, S.W.*
1869	Eastwick, Edward B., Esq., F.R.S., M.P. 38, *Thurloe-square, Brompton, S.W.*
1857	Eastwick, Captain W. J. 12, *Leinster-terrace, Hyde-park, W.*
1863	Eaton, F. A., Esq. *New University Club, St. James's-street, S.W.*
1862	670*Eaton, H., Esq. 16, *Prince's-gate, Hyde-park, W.*
1862	*Eaton, Henry William, Esq., M.P. 16, *Prince's-gate, Hyde-park, W.*
1864	*Eaton, William Merton, Esq., 16, *Prince's-gate, Hyde-park, W.*
1866	Eatwell, Surgeon-Major W. C. B., M.D. *Oriental Club, Hanover-square, W.*
1861	Eber, General F. 33, *St. James's-square, S.W.*
1862	Ebury, Lord. 107, *Park-street, Grosvenor-square, W.; and Moor-park, Herts.*
1872	Eddy, C. W., Esq. 12, *Eccleston-square, S.W.*
1862	Eden, Vice-Admiral Charles, C.B. 20, *Wilton-place, S.W.*
1858	Edge, Rev. W. J., M.A. *Benenden-vicarage, near Staplehurst, Kent.*
1863	Edgeworth, M. P., Esq., BENG. C.S. *Mastrim-house, Anerly, S.*
1867	680*Edward, James, Esq. *Balruddery, by Dundee, N.B.*
1866	*Edwardes, Thomas Dyer, Esq. 5, *Hyde-park-gate, Kensington, W.*
1871	*Edwardes, Thomas Dyer, Esq., jun. 5, *Hyde-park-gate, Kensington.*
1871	Edwards, James Lyon, Esq. 7, *The Avenue, Belsize-park, Hampstead, N.W.*
1868	Edwards, Rev. A. T., M.A. 39, *Upper Kennington-lane, S.*
1865	Edwards, G. T., Esq., M.A. *Devon-lodge, Alexandra-road, London, N.W.*
1861	*Edwards, Henry, Esq., M.P. 53, *Berkeley-square, W.*
1860	Edwards, Major J. B., R.E. *United Service Club, S.W. Care of Messrs. H. S. King and Co., 65, Cornhill, E.C.*
1853	Egerton, Captain the Hon. Francis, R.N., M.P. *Devonshire-house, S.W.; and H.M.S. 'St. George.'*
1868	Elder, A. L., Esq. *Carlisle-house, Hampstead.*
1863	690*Elder, George, Esq. *Knock-castle, Ayrshire.*
1867	Eley, Charles John, Esq. *Old Brompton, S.W.*
1865	Elias, Ney, jun., Esq. 64, *Inverness-terrace, Bayswater, W.*
1863	Ellerton, John L., Esq. 6, *Connaught-place, Hyde-park, W.*
1860	Elliot, G., Esq., M.P., C.E. *The Hall, Houghton-le-Spring, near Fence Houses, Durham.*
1857	*Elliot, Capt. L. R. *La Mailleraye-sur-Seine, Seine Inférieure. Care of J. L. Elliot, Esq., 10, Connaught-place, W.*
1871	Elliot, William, Esq. 2, *De Crespigny-terrace, Denmark-hill, Camberwell, S.*
1830	*Elliott, Rev. Charles Boileau, M.A., F.R.S. *Tattingstone, Suffolk.*
1868	Ellis, C. H. Fairfax, Esq., Lieut. R.A. *Shoeburyness, Essex.*
1865	Ellis, W. E. H., Esq. *Hasfield-rectory, Gloucester; Oriental Club, W.; and Byculla Club, Bombay.*
1871	700 Ellis, Walter J., Esq. 102, *Harley-street, Cavendish-square, W.*

Year of Election.	
1858	Elphinstone, Major Howard C., R.E. *Buckingham-palace, S.W.*
1869	Elsey, Colonel William. *West-lodge, Ealing, W.*
1857	Elton, Sir A. H., Bart. *Athenæum Club, S.W.; and Clevedon-court, Somersetshire.*
1872	Elwell, W. R. G., Esq. 8, *Beverley-road, South Penge-park, S.E.*
1868	Ely, John Henry Wellington Graham Loftus, Marquis of. *Rathfarnham Castle, Dublin.*
1862	*Emanuel, Harry, Esq. 8, *Clarence-terrace, Regent's-park, N.W.*
1863	Emslie, John, Esq. 47, *Gray's-inn-road, W.C.*
1830	Enderby, Charles, Esq., F.R.S., F.L.S. 13, *Great St. Helen's, E.C.*
1860	Enfield, Edward, Esq., F.S.A. 19, *Chester-terrace, Regent's-park, N.W.*
1863	710 Engleheart, Gardner D., Esq. *Gatton-cottage, Reigate.*
1870	Erskine, Claude J., Esq., Bombay Civil Service. 87, *Harley-street, W.; and Athenæum Club, S.W.*
1852	Erskine, Admiral John Elphinstone, M.P., C.B. *H.M.S. 'Edgar;'* 1 *L, Albany, W.; and Cardross, Stirling, N.B.*
1857	*Esmeade, G. M. M., Esq. 29, *Park-street, Grosvenor-square, W.*
1865	Evans, Colonel William Edwyn. 55, *Seymour-street, Portman-square, W.*
1870	*Evans, Edward Bickerton, Esq. *Whitbourne-hall, near Worcester.*
1857	Evans, F. J., Esq., Staff Captain R.N., F.R.S., F.R.A.S. 116, *Victoria-street, S.W.*
1830	*Evans, Vice-Admiral George. 1, *New-street, Spring-gardens, S.W.; and Englefield-green, Staines.*
1870	Evans, Lieut.-Colonel Henry Lloyd. 14, *St. James's-square, S.W.*
1857	Evans, Thos. Wm., Esq. 1, *Dartmouth-street, Westminster, S.W.; and Allestree-wall, Derby.*
1830	720*Evans, W., Esq.
1867	Evans, W. Herbert, Esq. 32, *Hertford-street, Mayfair, W.*
1861	Evelyn, Lieut.-Colonel George P. 34, *Onslow-gardens, Brompton, S.W.*
1851	*Evelyn, William J., Esq., F.S.A. *Evelyn Estate-office, Evelyn-street, Deptford.*
1830	*Everett, James, Esq., F.S.A.
1865	Everitt, George A., Esq. *Knowle-hall, Warwickshire.*
1856	Ewing, J. D. Crum, Esq. 3, *Lime-street-square, E.C.*
1869	Ewing, John Orr, Esq. *Levenfield-house, Alexandria, Dumbartonshire.*
1857	Eyre, Edward J., Esq.
1861	Eyre, George E., Esq. 59, *Lowndes-square, Brompton, S.W.*
1856	730 Eyre, Major-Gen. Sir Vincent, C.B. *Athenæum Club, S.W.; and* 33, *Thurloe-square, S.W.*
1861	Fairbairn, Sir William, Bart., C.E., F.R.S. *Manchester.*
1870	Fairbridge, Charles, Esq., Queen's Proctor. *Court of Vice-Admiralty, Cape Town.*
1869	Fairfax, Captain Henry, R.N. *Army and Navy Club, S.W.*
1856	Fairholme, George Knight, Esq. *Care of Mr. Ridyway,* 169, *Piccadilly, W.*

Year of Election.	
1870	Fairland, Edwin, Esq., M.D. (Surg. 21st Hussars). *Lucknow, Oude.*
1838	Falconer, Thomas, Esq. *Usk, Monmouthshire.*
1868	Falconer, William, Esq. 23, *Leadenhall-street, E.C.; and* 42, *Hilldrop-road, Camden-new-town, N.*
1857	Falkland, Lucius Bentinck, Viscount. *Shutterskelfe, Yorkshire.*
1871	Fane, Edward, Esq. 14, *St. James's-square, S.W.*
1855	740 *Fanshawe, Admiral E. G. 63, *Eaton-square, S.W.*
1868	*Farquharson, Lieut.-Col. G. McB. *Care of Messrs. King and Co., Cornhill, E.C.*
1863	*Farrer, W. Jas., Esq. 24, *Bolton-street, Piccadilly, W.*
1863	*Faunthorpe, Rev. J. P., M.A. *Training-college, Battersea.*
1869	Fawcett, Captain Edward Boyd, M.A. *Dunolly, Torquay.*
1869	Fawcett, Henry, Esq. *Wainsford, Lymington.*
1853	*Fayrer, Joseph, Esq., M.D. *Calcutta. Care of General Spens,* 4, *Rosslyn-street, Pilrig, Edinburgh.*
1858	Fazakerley, J. N., Esq. 17, *Montagu-street, Portman-square, W.*
1866	Felkin, William, Esq., jun., F.Z.S. *Beeston, near Nottingham.*
1840	*Fergusson, James, Esq., F.R.S., D.C.L. 20, *Langham-place, W.*
1863	750 Ferreira, Baron De. 12, *Gloucester-place, Portman-square, W.*
1860	Ferro, Don Ramon de Silva.
1871	Festing, Captain Robert, R.E. *South Kensington Museum, S.W.*
1872	Fenner, William, Esq., 3, *Den-crescent, Teignmouth, South Devon.*
1865	Field, Hamilton, Esq. *Thornton-lodge, Thornton-road, Clapham-park.*
1844	Findlay, Alex. George, Esq. 53, *Fleet-street, E.C.; and Dulwich-wood-park, S.*
1862	Finnis, Thomas Quested, Esq., Alderman. *Wanstead, Essex, N.E.*
1870	*Firth, John, Esq., J.P. *Care of J. W. Firth, Esq.,* 2, *Gresham-place, Lombard-street, E.C.*
1863	Fisher, John, Esq. 60, *St. James's-street, S.W.*
1869	Fitch, Frederick, Esq., F.R.M.S. *Hadleigh-house, Highbury-new-park, N.*
1857	760 *Fitzclarence, Commander the Hon. George, R.N. 1, *Warwick-square, S.W.*
1861	Fitzgerald, Captain Keane. 2, *Portland-place, W.*
1864	Fitzpatrick, Lieut. Francis Skelton, 42nd Regiment, Madras Army.
1857	Fitzwilliam, The Hon. C. W., M.P. *Brooke's Club, St. James's-street, S.W.*
1837	*Fitzwilliam, William Thomas, Earl. 4, *Grosvenor-square, W.; and Wentworth-house, Rotherham, Yorkshire.*
1865	*Fitzwilliam, William S., Esq. 28, *Ovington-square, Brompton, S.W.*
1863	Fleming, G., Esq. *Brompton Barracks, Chatham.*
1861	*Fleming, John, Esq. 18, *Leadenhall-street, E.C.*
1865	Fleming, Rev. T. S. *The Vicarage, St. Clement's, Leeds.*
1853	*Flemyng, Rev. Francis P. *Lenzie, Glasgow.*
1862	770 Fletcher, John Charles, Esq. *Dale-park, Arundel; and Eaton-place, S.W.*
1857	Fletcher, Thomas Keddey, Esq. *Union-dock, Limehouse, E.*
1866	Flood, John Edwin, Esq.
1864	Flower, Capt. L. *Bunstead, Surrey; and Queen's United Service Club, S.W.*
1863	Foley, Major-Gen. the Hon. St. George, C.B. 24, *Bolton-street, W.*

Year of Election	
1861	Foord, John Bromley, Esq. 52, *Old Broad-street, E.C.*
1860	Forbes, Commander Charles S., R.N. *Army and Navy Club, S.W. Care of Messrs. Woodhead.*
1863	Forbes, Capt. C. J. F. Smith. 5, *Hatch-street, Dublin.*
1867	Forbes, Geo. Edward, Esq. *Colinton, Ipswich, Queensland; care of Messrs. Edenborough and Co., 54, Moorgate-street, E.C.; Union Club, S.W.; 11, Melville-street, Edinburgh; New Club, Edinburgh.*
1860	Forbes, Lord, M.A. *Castle Forbes, Aberdeenshire.*
1869	780 Ford, Col. Barnett (Governor of the Andaman Islands. 48, *Upper-park-road, Hampstead.*
1868	Forster, Hon. Anthony. *Newsham-grange, Winston, Darlington, Durham.*
1839	*Forster, Right Hon. William Edward, M.P. 80, *Eccleston-square, S.W.; and Burley, near Otley.*
1867	Forsyth, T. Douglas, Esq., C.B. (B.C.S.), Commissioner, Jullundhur, Punjaub. *Care of Messrs. Sinclair, Hamilton, and Co.*, 17, *St. Helen's-place, E.C.*
1861	Forsyth, William, Esq., M.P., Q.C. 61, *Rutland-gate, S.W.*
1858	Fortescue, Right Hon. Chichester S., M.P. 7, *Carlton-gardens, S.W.*
1861	*Fortescue, Hon. Dudley F., M.P. 9, *Hertford-street, Mayfair, W.*
1869	Foster, Ebenezer, Esq. 19, *St. James's-place, St. James's, S.W.*
1866	Foster, Edmond, jun., Esq. 79, *Portsdown-road, Maida-vale, W.*
1864	Foster, H. J., Esq.
1871	790 Foster, James Murray, Esq., L.M.D., &c. *Nazeerah, Assam, Bengal. Care of Joseph Foster, Esq., Cullompton, Devon.*
1863	*Fowler, J. T., Esq. *Government Inspector of Schools, Adyar, Madras, India. Care of Rev. A. Wilson, National Society's Office, Sanctuary, Westminster.*
1850	*Fowler, Robert N., Esq., M.P., M.A. 50, *Cornhill, E.C.; and Tottenham, N.*
1859	Fox, Lieut.-Colonel A. Lane. 10, *Upper Phillimore-gardens, Kensington, W.*
1830	*Fox, Lieut.-General C. R. *Travellers' Club, S.W.; and* 1, *Addison-road, Kensington, W.*
1866	Fox, D. M., Esq., Chief Engineer of the Santos and St. Paulo Railway. *St. Paulo, Brazil.*
1864	*Fox, Francis E., Esq., B.A. *Falmouth.*
1865	Fox, Samuel Crane, Esq. 31, *Cambridge-gardens, Notting-hill, W.*
1865	*Franks, Aug. W., Esq. 103, *Victoria-street, S.W.*
1860	Franks, Charles W., Esq. 2, *Victoria-street, S.W.*
1867	800 Fraser, Edward John, Esq., Solicitor. 1, *Percy-villas, Campden-hill, Kensington, W.*
1862	Fraser, Captain H. A., R.N. *Zanzibar. Care of Messrs. Grindlay.*
1866	Fraser, Captain T. *Otago, New Zealand.*
1868	Frater, Alexander, Esq. *Cuton. Care of Thomas Frater, Esq., National Provincial Bank of England, Brecon, Wales.*
1866	Freeman, Daniel Alex., Esq., Barrister-at-Law. *Plowden-buildings, Temple, E.C.*
1868	Freeman, Henry W., Esq. *Junior Athenæum Club, S.W.*
1869	Freke, Thomas George, Esq. 1, *Cromwell-houses, Kensington, W.*
1863	Fremantle, Captain Edmund Robert, R.N. 4, *Upper Eccleston-street, S.W.*

Year of Election.		
1856		Fremantle, Right Hon. Sir Thomas F., Bart. 20, *Eaton-place, S.W.*
1864		Freme, Major James H. *Wrentnall-house, Shropshire; and Army and Navy Club, S.W.*
1850	810	Frere, Bartle John Laurie, Esq. 45, *Bedford-square, W.C.*
1839		*Frere, George, Esq. *Cape of Good Hope.*
1867		Frere, Sir Hy. Bartle Edw., K.C.B., G.C. Star of India. *Wressil Lodge, Wimbledon, Surrey; and 22, Prince's gardens, W.*
1842		Frere, William Edw., Esq., F.R.A.S. *The Rectory, Bitton, Gloucestershire.*
1869		*Freshfield, Douglas W., Esq. 6, *Stanhope-gardens, South Kensington, W.; and United University Club, S.W.*
1863		Fuidge, William, Esq. 5, *Park-row, Bristol.*
1865		Fuller, Thomas, Esq. 119, *Gloucester-terrace, Hyde-park, W.; United University Club, S.W.*
1860		Fussell, Rev. J. G. Curry. 16, *Cadogan-place, S.W.; and Kiloskehane-castle, Templemore, Ireland.*
1868		Fyfe, Andrew, Esq., M.D. 112, *Brompton-road, S.W.*
1866		Fytche, Major-Gen. Albert. 21, *Lowndes-square, S.W.; and Reform Club, S.W.*
1863	820	*Gabrielli, Antoine, Esq. 6, *Queen's-gate-terrace, Kensington, W.*
1858		Gaisford, Thomas, Esq. *Travellers' Club, S.W.*
1855		*Galloway, John James, Esq.
1869		Galsworthy, Frederick Thomas, Esq. 8, *Queen's-gate, Hyde-park, W.*
1848		*Galton, Captain Douglas, R.E. 12, *Chester-street, Grosvenor-place, S.W.*
1850		*Galton, Francis, Esq., M.A., F.R.S. 42, *Rutland-gate, S.W.; and 5, Bertie-terrace, Leamington.*
1871		Galton, Theodore Howard, Esq. 78, *Queen's-gate; and Hadzor-ho., Droitwich.*
1854		*Gammell, Major Andrew. *Drumtochty, Kincardineshire, N.B.*
1869		Gardner, Christopher T., Esq. 3, *St. James's-terrace, Paddington, W.*
1865		Gardner, Captain G. H., R.N. 7, *James-street, Westbourne-terrace, W.*
1866	830	Gardner, John Dunn, Esq. 19, *Park-street, Park-lane, W.*
1863		Gascoigne, Frederic, Esq. *Parlington, Yorkshire.*
1859		*Gassiot, John P., jun., Esq. 6, *Sussex-place, Regent's-park, N.W.*
1866		Gastrell, Lieut.-Col. James E. (B. Staff Corps). *Surveyor-General's Office, Calcutta. Care of H. T. Gastrell, Esq., 36, Lincoln's-inn-fields, W.C.*
1866		*Gatty, Charles H., Esq., M.A., *Felbridge-park, East Grinstead, Sussex.*
1870		*Gellatly, Edward, Esq. *Uplands, Sydenham.*
1865		George, Rev. H. B. *New College, Oxford.*
1859		Gerstenberg, Isidore, Esq. *Stockley-house, North-gate, Regent's-park, N.W.*
1866		*Gibb, George Henderson, Esq., 13, *Victoria-street, Westminster, S.W.*
1865		*Gibbons, The Right Hon. Sir Sills John, Bart., Lord Mayor of London, 13, *Upper Bedford-place, Russell-square, W.C.*
1859	840	*Gibbs, H. Hucks, Esq. *St. Dunstan's, Regent's-park, N.W.*
1870		Gibson, James Y., Esq. *Edinburgh. Care of Messrs. Williams and Norgate.*

Year of Election.		
1855		Gibraltar, Right Rev. and Hon. C. A. Harris, Bishop of. *Gibraltar Palace, Malta.*
1855		Gillespie, Alexander, Esq. *Heathfield, Walton-on-Thames, Surrey.*
1866		*Gillespie, William, Esq. (*of Torbane-hill*). 46, *Melville-street, Edinburgh.*
1857		Gillespy, Thomas, Esq. *Brabant-court, Philpot-lane, E.C.*
1868		*Gillett, Alfred, Esq. 113, *Piccadilly, W.; and Banbury, Oxon.*
1863		*Gillett, William, Esq. 6 *L, Albany, W.*
1861		Gilliat, Alfred, Esq. *Postern-house, Tunbridge.*
1868		Gilliat, Algernon, Esq. *Fernhill, near Windsor.*
1863	850	Gillies, Robert, Esq., C.E. *Dunedin, Otago, New Zealand.*
1867		Gisborne, Fred. N., Esq., Engineer and Electrician. 445, *West Strand, W.C.*
1864		Gladstone, George, Esq. *Clapham-common, S.*
1863		Gladstone, J. H., Esq., PH.DR. 17, *Pembridge-square, W.*
1862		*Gladstone, Robert Stuart, Esq.
1846		*Gladstone, William, Esq. 57½, *Old Broad-street, E.C.*
1864		*Gladstone, W. K., Esq. 39 A, *Old Bond-street, W.; and Fitzroy-park, Highgate, N.*
1867		Glass, H. A., Esq. 4, *Gray's-inn-square, W.C.*
1857		Gleig, Rev. G. R., M.A. *Chaplain-General, Chelsea-hospital, S.W.*
1854		Glen, Joseph, Esq., Mem. Geogr. Soc. of Bombay. *Oriental Club, W.*
1857	860	Glover, Commr. John H., R.N. *Lagos; and Army and Navy Club, S.W.*
1866		Glover, Robert Reaveley, Esq. 30, *Great St. Helen's, E.C.*
1870		Glover, Colonel T. G., R.E. *Barwood, Horsham, near Esher, Surrey.*
1868		Glyn, Richard H., Esq. 10, *King's-arms-yard, E.C.; and Oriental Club, S.W.*
1864		Glyn, Sir Richard George, Bart. *Army and Navy Club, S.W.*
1869		Goldney, G. Esq., M.P. 40, *Hill-street, Berkeley-square, W.*
1868		Goldsmid, Sir Francis, Bart., M.P. *Inner-circle, Regent's-park, N.W.*
1863		Goldsmid, Lieut.-Col. Frederick John. *Harrow-on-the-hill; Southborough, Kent; and United Service Club, S.W.*
1861		Goldsmid, Julian, Esq. 49, *Grosvenor-street, S.W.*
1868		Goldsworthy, Major W. T. *British Service Club, 4, Park-place, St. James's, S.W.*
1860	870	Gooch, Thomas Longridge, Esq. *Team-lodge, Saltwell, Gateshead-on-Tyne.*
1864		Goodall, George, Esq. *Messrs. Cox and Co., Craig's-court; and Junior Carlton Club, W.*
1863		*Goodenough, Captain J. G., R.N. *United Service Club, S.W.*
1864		*Goodenough, Lieut.-Col., R.A. *Care of Messrs. Cox and Co., Craig's-court, S.W.*
1871		*Goodwin, William, Esq. *Claughton-park, near Birkenhead.*
1865		*Goolden, Charles, Esq. *United University Club, S.W.*
1861		Gooldin, Joseph, Esq. 18, *Lancaster-gate, W.*
1856		*Gordon, Major-Gen. the Hon. Alexander H., C.B. 4, *Warrior-square, St. Leonard's on Sea.*
1854		Gordon, Harry George, Esq. 1, *Clifton-place, Hyde-park-gardens, W.; and Kilwechassi, Dunkeld, Perthshire.*

Year of Election.		
1856		Gordon, Admiral the Honourable John.
1870	880	Gordon, Russell Manners, Esq. 38, *Alpha-road, St. John's-wood, N.W.*
1866		Gore, Augustus F., Esq., Colonial Secretary. *Demerara.*
1853		Gore, Richard Thomas, Esq. 6, *Queen-square, Bath.*
1859		Gosling, Fred. Solly, Esq. 20, *Spring-gardens, S.W.*
1862		Goss, Samuel Day, Esq., M.D. 111, *Kennington-park-road, S.*
1870		Gottlieb, Felix Henry, Esq., J.P. *Garden-court, Temple; and* 16, *Colchester-road, West Brompton, W.*
1868		Gough, Hugh, Viscount, F.L.S. *Lough Cutra Castle, Gort, Co. Galway.*
1835		Gould, Lieut.-Colonel Francis A. *Buntingford, Herts.*
1846		Gould, John, Esq., F.R.S., F.L.S. 26, *Charlotte-street, Bedford-square, W.C.*
1870		Gould, Rev. Robert John (Vicar of Wadham College, Oxford). *Stratfield Mortimer, near Reading.*
1867	890	Grabham, Michael, Esq., M.D. *Madeira. Care of C. R. Blandy, Esq.,* 25, *Crutched-friars, E.C.*
1868		Graeme, H. M. S., Esq.
1869		Graham, Andrew, Esq., Staff Surg. R.N. *Army and Navy Club, S.W.*
1858		Graham, Cyril C., Esq. 9, *Cleveland-row, St. James's, S.W.; and Debroe-house, Watford, Herts.*
1868		*Graham, Thomas Cuninghame, Esq. *Carlton Club, S.W.; and Dunlop-house, Ayrshire.*
1871		Graham, J. C. W. Paul, Esq. 1, *Carlisle-place, Victoria-street, S.W.; and Brooke's Club, St. James's-street, S.W.*
1861		Grant, Alexander, Esq. *Oakfield-house, Hornsey, N.*
1870		*Grant, Andrew, Esq. *Oriental Club, Hanover-square, W.*
1863		*Grant, C. Mitchell, Esq. 4, *Albemarle-street, W.*
1861		Grant, Daniel, Esq. 11, *Warwick-road, Upper Clapton, N.*
1865	900	*Grant, Francis W., Esq. *Army and Navy Club, S.W.*
1860		Grant, Lieut.-Col. James A., C.B., C.S.I. *E. India U. S. Club, S.W.; and* 7, *Park-square, Regent's-park, N.W.*
1862		*Grant, Lieut. J. M. (late 25th Reg.) *Elands Port, Cape of Good Hope. Care of Messrs. Ridgway and Sons,* 2, *Waterloo-place, S.W.*
1859		Grantham, Captain James, R.E.
1857		Graves, Rev. John. *Underbarrow-parsonage, Milnthorpe, Westmoreland.*
1870		Gray, Charles W., Esq. 19, *Regent's-park-road, N.W.*
1871		Gray, Mathew, Esq. *St. John's-park, Blackheath, S.E.*
1839		*Gray, John Edw., Esq., PH. DR., F.R.S., Z.S. and L.S. *British Museum, W.C.*
1868		Gray, Lieut.-Col. William, M.P. 26, *Prince's-gardens, W.; and Darcy Lever-hall, near Bolton.*
1862		Greathed, Lieut.-Colonel Wilberforce, W. H., C.B.
1863	910	Greaves, Rev. Richard W. 1, *Whitehall-gardens, W.*
1861		Green, Captain Francis, 58th Regiment.
1871		Green, John Henry, Esq. 8, *Weighton-road, South Penge-park, S.E.*
1871		Green, Joseph E., Esq. 12A, *Myddelton-square, E.C.*

Year of Election.	
1868	Green, Rev. W., M.A. *Chaplain to the Tower of London.*
1869	Green, Sir W. H. R., K.C.S.I., C.B. 36, *St. George's-road, Eccleston-square, S.W.*
1871	Greene, Captain John Clinton, R.A. *Fort Brockhurst, Gosport.*
1830	Greene, Thomas, Esq. *Whittington-hall, near Burton, Westmoreland.*
1857	*Greenfield, W. B., Esq. 59, *Porchester-terrace, Hyde-park, W.; and Union Club, S.W.*
1870	Greenup, W. Thomas, Esq. *Woodhead-road, London-road, Sheffield.*
1871	920 Greg, Thomas, Esq. 37, *Lowndes square, S.W.*
1865	Greg, W. R., Esq., Comptroller of H.M.S. Stationery Office. *Wimbledon, S.W.*
1858	*Gregory, Augustus Charles, Esq. *Surveyor-General, Brisbane, Queensland, Australia.*
1858	Gregory, Charles Hutton, Esq., C.E. 1, *Delahay-street, Westminster, S.W.*
1860	*Gregory, Francis Thomas, Esq. *Queensland.*
1858	*Gregory, Isaac, Esq. *Merchants'-college, Blackpool.*
1857	*Grellet, Henry Robert, Esq. *Care of L. Meulenhoff, Esq., 87, Great Tower-street, E.C.*
1865	Grenfell, Henry R., Esq., M.P. 15, *St. James's-place, S.W.*
1853	Grenfell, Riversdale W., Esq. 27, *Upper Thames-street, E.C.*
1830	*Greswell, Rev. Richard, M.A., F.R.S. 39, *St. Giles, Oxford.*
1866	930 Grey, Charles, Esq. 13, *Carlton-house-terrace, S.W.*
1837	*Grey, Sir George, K.C.B. *Colonial Office; and Grosvenor-mansions, S.W.*
1864	Grierson, Charles, Esq. 1, *Dryden-place, Blacket-place, Edinburgh, Scotland.*
1868	Griffin, Daniel, Esq. 18, *Leadenhall-street, E.C.*
1862	Griffin, James, Esq. 2, *Eastern-parade, Southsea: and The Hard, Portsea, Hants.*
1861	*Griffith, Daniel Clewin, Esq. 20, *Gower-street, W.C.*
1839	Griffith, John, Esq. 16, *Finsbury-place-south, E.C.*
1863	Griffith, Sir Richard. 20, *Eccleston-square, S.W.*
1836	Griffith, Richard Clewin, Esq. 20, *Gower-street, W.C.*
1867	Griffiths, Captain A. G. F., 63rd Reg. Major of Brigade, Gibraltar). *St. Margaret's-vale, Chatham.*
1869	940 Griffiths, William, Esq., J.P. 24, *Great Cumberland-place, W.; and The Weikin, Lindfield, Sussex.*
1855	Grimrod, R. B., Esq., M.D., LL.D., F.L.S., &c. *Townsend-house, Malvern.*
1861	Grosvenor, Lord Richard, M.P. 33, *Upper Grosvenor-street, W.*
1857	Gruneisen, Charles Lewis, Esq. 16, *Surrey-street, Strand, W.C.*
1861	Gunnell, Captain Edmund H., R.N. *Army and Navy Club, S.W.; and 21, Argyll-road, Campden-hill, W.*
1859	*Gurney, John H., Esq. *Marlton, Totnes.*
1857	Gurney, Samuel, Esq. 20, *Hanover-terrace, Regent's-park, N.W.*
1862	Guthrie, James Alexander, Esq. 30, *Portland-place, W.*
1865	Gwyther, John H., Esq. *Meadowcroft, Lower Sydenham, S.E.*

Year of Election		
1870		Habicht, Claudius Edward, Esq. *Garrick Club, W.C.*
1863	950	Hadfield, William, Esq. 11, *Inverness-road, W.*
1865		Hadley, Henry, Esq., M.D. *Needwood-lodge, Bay's-hill, Cheltenham.*
1863		Hadow, P. D., Esq. *Sudbury-priory, Middlesex.*
1865		Halcombe, Rev. J. J. *Charterhouse, E.C.*
1868		Hale, Rev. Edward, M.A. *Eton College; and United University Club, S.W.*
1865		Hale, Warren S., Esq., Alderman. 71, *Queen-street, Cheapside, E.C.*
1860		Haliday, Lieut.-Colonel William Robert. *United Service Club, S.W.*
1853		Halifax, Viscount, G.C.B. 10, *Belgrave-sq., S.W.; and Hickleton, Yorkshire.*
1853		*Halkett, Rev. Dunbar S. *Little Bookham, Surrey.*
1853		*Halkett, Lieut. Peter A., R.N.
1853	960	Hall, Admiral Sir William Hutcheson, K.C.B., F.R.S. *United Service Club, S.W.; and* 48, *Phillimore-gardens, Kensington, W.*
1871		Hall, Captain Robert, R.N., C.B. *Pembroke-dockyard.*
1861		Hall, Charles Hall, Esq. *Watergate-house, Emsworth.*
1863		Hall, Henry, Esq. 109, *Victoria-street, S.W.*
1862		Hall, James Tebbutt, Esq. *Fore-street, Limehouse, E.*
1869		*Hall, James MacAlester, Esq. 15, *Woodside-crescent, Glasgow.*
1863		Hall, Thomas F., Esq., F.C.S. 29, *Warwick-square, S.W.*
1865		Hallett, Lieut. Francis C. H., R.H.A.
1858		Halloran, Arthur B., Esq. 3, *Albert-terrace, St. Leonard's, Exeter.*
1871		*Hamilton, Andrew, Esq., Lieut. 102nd Regiment. *The House of Falkland, Fyfe; and Naval and Military Club, W.*
1862	970	Hamilton, Archibald, Esq. *South Barrow, Bromley, Kent, S.E.*
1866		Hamilton, Rear-Admiral C. Baillie. *Care of Messrs. Walford, Bros.,* 320, *Strand, W.C.; and* 50, *Warwick-square, S.W.*
1861		Hamilton, Lord Claude, M.P. 19, *Eaton-square, S.W.; and Barons-court, County Tyrone.*
1830		*Hamilton, Captain Henry G., R.N. 71, *Eccleston-square, S.W.*
1869		Hamilton, Captain Richard Vesey, R.N. *H.M.S. 'Achilles,' Portland.*
1861		Hamilton, Col. Robert William, Grenadier Guards. 18, *Eccleston-square, S.W.*
1863		Hamilton, R., Esq. *Oriental Club, W.*
1830		Hamilton, Terrick, Esq. 121, *Park-street, Grosvenor-square, W.*
1846		Hamilton, Rear-Admiral W. A. Baillie. *Macartney-house, Blackheath, S.E.*
1871		Hanbury, P. Capel, Esq. 60, *Lombard-street, E.C.*
1853	980	*Hand, Admiral George S., C.B. *U. S. Club, S.W.; and H.M.S. 'Victory.'*
1860		*Handley, Benjamin, Esq. *Lima, Peru; and* 74, *Market-place, Sheffield.*
1866		Hanham, Commr. T. B., R.N. *Manston-house, near Blandford, Dorset.*
1861		*Hankey, Blake Alexander, Esq.
1870		*Hankey, Rodolph Alexander, Esq. 9, *Suffolk-place, Pall-mall, S.W.*
1857		Hankey, Thomson, Esq. 45, *Portland-place, W.*
1837		*Hanmer, Sir J., Bart., M.P., F.R.S. *Hanmer-hall and Bettisfield-park, Flintshire.*
1859		*Hansard, Henry, Esq. 13, *Great Queen-street, W.C.*
1870		Harbord, John B., Esq., M.A., Chaplain R.N. 69, *Victoria-park-road, E.*

Year of Election.	
1870	Harcourt, Capt. Alf. Fredk. Pollock (Beng. Staff Corps). *Oriental Club, W.*
1840	990*Harcourt, Egerton V., Esq. *Whitwell-hall, York.*
1864	*Hardie, Gavin, Esq. 113, *Piccadilly, W.*
1864	Harding, Major Charles, F.R.S.L., F.S.S., F.A.S.L. *Grafton Club, 10, Grafton-street, Piccadilly, W.*
1864	Harding, J. J., Esq. 1, *Barnsbury-park, Islington, N.*
1864	Hardinge, Capt. E., R.N. 32, *Hyde-park-square, W.*
1861	Hardinge, Henry, Esq., M.D. 18, *Grafton-street, Bond-street, W.*
1868	Harper, J. A. W., Esq. 23, *Grosvenor-road, Pimlico, S.W.; and Lloyd's, E.C.*
1853	Harris, Admiral the Hon. E. A. J., C.B. *H.B.M.'s Envoy Extraordinary and Minister Plenipotentiary, Légation Britannique, Berne. Messrs. Woodhead.*
1869	Harris, Lieut. G. F., 20th Regiment. *Care of Colonel Harris, 28, Leinster-road, Dublin.*
1859	Harris, Capt. Henry, H.C.S. 35, *Gloucester-terrace, Hyde-park, W.*
1871	1000Harris, Edwd., Esq. *Rydal-villa, Longton-grove, Upper Sydenham.*
1869	Harris, John, Esq. 31, *Belsize-park, Hampstead, N.W.*
1865	Harris, John M., Esq.
1863	Harrison, Charles, Esq. 3, *Great Tower-street, E.C.*
1870	Harrison, Charles, Esq. 10, *Lancaster-gate, W.*
1865	*Harrison, William, Esq., F.S.A., F.G.S., &c. *Conservative Club, S.W.; Royal Thames Yacht Club, 7, Albemarle-street, W.; and Samlesbury-hall, near Preston, Lancashire.*
1838	Harrowby, Dudley, Earl of, F.R.S. *Sandon-house, Lichfield; and Norton, Gloucestershire.*
1872	Harston, Edward F. B., Esq. 14, *Mecklenburgh-square, W.C.*
1868	*Hart, J. L., Esq. 20, *Pembridge-square, W.*
1854	*Hartland, F. Dixon, Esq., F.S.A., &c. 14, *Chesham-place, S.W.; and the Oaklands, near Cheltenham.*
1863	1010Harvey, Charles, Esq. *Rathgar-cottage, Streatham, S.*
1865	Harvey, C. H., Esq., M.D. 18, *Colville-square, W.*
1865	Harvey, Edward N., Esq. *Springfield, near Ryde, Isle of Wight; and Carlton Club, S.W.*
1867	Harvey, James, Esq. (Solicitor). *Esk-street, Invercargill, Southland, New Zealand. Care of the Bank of Otago, Old Broad-street, E.C.*
1864	Harvey, John, Esq. *Ickwell Bury, Biggleswade.*
1864	Harvey, John, Esq. 7, *Mincing-lane, E.C.*
1869	Harvey, John, Esq., LL.D. *Château Deslyons, Boulogne-sur-Mer.*
1866	Harvey, Richard M., Esq. 13, *Devonshire-street, Portland-place, W.*
1864	Harvey, W. D., Esq. *Holbrooke-house, Richmond.*
1871	Harvie, Edgar Christmas, Esq. 16, *Eaton-road, Haverstock-hill, N.W.*
1858	1020Hawker, Edward J., Esq. 37, *Cadogan-place, S.W.*
1834	Hawkins, Francis Bisset, Esq., M.D., F.R.S. 146, *Upper Harley-street, W.; and Lewell-lodge, Dorchester.*
1840	*Hawkins, John, Esq.

Year of Election.	
1858	*Hawkins, Colonel J. Summerfield, R.E. *The Castle, Dublin.*
1861	Hawksley, Thomas, Esq., C.E. 14, *Phillimore-gardens, Kensington, S.W.*
1871	Hay, Andrew, Esq. *Oriental Club, Hanover-square, S.W.; and Bombay.*
1852	*Hay, Rear-Admiral Sir J. C. Dalrymple, Bart., M.P., F.R.S. 108, *St. George's-square, S.W.; U.S. Club, S.W.; Dunragit, Glenluce; and Harrow-on-the-hill, N.W.*
1863	*Hay, Lord John, M.P. 15, *Cromwell-road, South Kensington, W.*
1865	Hay, Lord William. *B 5, Albany, W.*
1859	Hay, Major W. E. 7, *Westminster-chambers, Victoria-road, S.W.; and Garrick Club, Garrick-street, W.C.*
1870	1030Haynes, Stanley L., Esq., M.D. *Malvern-link, Worcestershire.*
1868	Haysman, David, Esq. *Portway-house, Weston, Bath.*
1862	Head, Alfred, Esq. 13, *Craven-hill-gardens, Bayswater, W.*
1871	Head, Henry, Esq. *Stoke Newington, N.*
1871	Head, Geo. T., Esq. *East Cliff House Grammar-school, Margate.*
1863	Headlam, Right Hon. Thomas E., M.P. 27, *Ashley-place, Victoria-street, S.W.*
1856	Heath, J. Benj., Esq., F.R.S., F.S.A. 31, *Old Jewry, E.C.*
1863	Heathfield, W. E., Esq. *Arthur's Club, S.W.*
1861	Hector, Alexander, Esq. 6, *Stanley-gardens, Bayswater, W.*
1861	Hector, James, Esq., F.R.S., M.D. *Care of E. Stanford, Esq.*
1871	1042Heinemann, N., Esq., PH.D., 21, *Northumberland-place, Bayswater, W.*
1872	*Helme, Richard, Esq. *Walthamstow, Essex.*
1862	Hemans, Geo. Willoughby, Esq., C.E. *Westminster-chambers, Victoria-st., S.W.*
1870	Henderson, David Mitchell, Esq. 1, *Carden-place, Aberdeen; and Old Calabar, W. Africa.*
1871	*Henderson, E., Esq. *Care of Messrs. King and Co., Pall-mall, S.W.*
1853	Henderson, John, Esq. 2, *Arlington-street, Piccadilly, W.*
1866	Henderson, Patrick, Esq. *Care of George Reid, Esq.*, 21, *Abchurch-lane, E.C.*
1852	Henderson, William, Esq. 5, *Stanhope-street, Hyde-park-gardens, W.*
1844	*Heneage, Edward, Esq. *Stag's-end, Hemel Hempstead.*
1861	Henn, Rev. J., B.A., Head Master of the Manchester Commercial Schools. *Old Trafford, Manchester.*
1850	1050Hennessey, J. B. N., Esq. *1st Asst. Trig. Survey of India, Dehra in the Doon, N.W. Provinces, India. Care of Messrs. H. S. King and Co.*
1838	*Henry, Wm. Chas., Esq., M.D., F.R.S. *Haffield, near Ledbury, Herefordshire.*
1861	*Henty, Douglas, Esq. *Colchester.*
1870	Hepworth, Campbell, Esq. 2, *St. James's-square, Cheltenham.*
1857	Herd, Captain D. J. 2, *Norway-house, Limehouse, E.*
1858	Hertslet, Edward, Esq. *Librarian, Foreign-office, S.W.; and Belle-vue-house, Richmond, S.W.*
1871	Hertslet, Geo. Thos., Esq. *Lord Chamberlain's-office, St. James's-palace, S.W.*
1861	Heugh, John, Esq. *Tunbridge-wells.*
1849	*Heywood, James, Esq., F.R.S. *Athenæum Club, S.W.; and 26, Kensington-palace-gardens, W.*

Year of Election.	
1869	Heywood, Samuel, Esq. 171, *Stanhope-street, Hampstead-road, N.W.*
1869	1060Heyworth, Capt. Lawrence, 4th Royal Lancashire. *Junior United Service Club, S.W.*
1867	Higgins, Edmund Thomas, Esq., M.R.C.S. 122, *King Henry's-road, Haverstock-hill, N.*
1868	Hiley, Rev. W., M.A. 3, *Cambridge-gardens, Richmond-hill, S.W.*
1856	Hill, Arthur Bowdler, Esq. *South-road, Clapham-park, Surrey, S.*
1866	Hill, Berkeley, Esq. 14, *Weymouth-street, Portland-place, W.*
1854	Hill, Lieut.-Colonel Stephen J., Governor of Antigua. *Army and Navy Club, S.W. Care of Capt. E. Burnett, R.N., 14, Woburn-square, W.*
1872	Hill, Samuel, Esq., M.D. 22, *Mecklenburgh-square, W.C.*
1861	Hilliard, Lieut.-Colonel George Towers, Madras Staff Corps. 18, *Sandringham-gardens, Lolini, W.*
1870	Hilliard, R. Harvey, Esq., M.D. 6, *Neville-terrace, Hornsey-road, N.*
1858	Hinchliff, T. Woodbine, Esq., Barrister-at-Law. 64, *Lincoln's-inn-fields, W.C.*
1862	1070*Hinde, Samuel Henry, Esq. *Windham Club, S.W.*
1846	*Hindmarsh, Frederick, Esq. 4, *New-inn, Strand, W.C.*
1870	Hitchins, T. M., Esq., Lieut. R.A. *Sandown, Isle of Wight.*
1858	Home, Samuel, Esq., M.A. 1, *Upper Hyde-park-street, W.*
1855	Hobbs, Wm. Geo. Ed., Esq. *Beulah-cottage, London-road, Enfield, N.*
1868	Hobson, Stephen James, Esq. 32, *Nicholas-lane, Lombard-street; and* 10, *Regent's-park-road, N.W.*
1869	Hodges, Henry, Esq. *Brondesbury-lodge Collegiate-school, Kilburn.*
1856	*Hodgson, Arthur, Esq. *Clopton House, near Stratford-on-Avon.*
1871	*Hodgson, Henry Tylston, Esq. *Harpenden, St. Albans.*
1861	*Hodgson, James Stewart, Esq. 8, *Bishopsgate-street, E.C.*
1857	1080Hodgson, Kirkman Daniel, Esq. 8, *Bishopsgate-street, E.C.*
1869	*Hodgson, William H., Esq. *Treasury-chambers; and* 1, *Whitehall-gardens, S.W.*
1856	Hogg, James, Esq. 217, *Piccadilly, W.*
1868	Holdich, Thos. Hungerford, Esq., Lieut. R.E.
1839	*Holford, Robert S., Esq. *Dorchester-house, Park-lane, W.*
1867	Holland, Rev. Fred. Whitmore. 38, *Bryanston-street, W.*
1830	Holland, Sir Henry, Bart., M.D., F.R.S. 25, *Lower Brook-street, W.*
1861	Holland, Colonel James. *Southside, The Park, Upper Norwood, S.E.*
1863	Holland, Loton, Esq. 6, *Queen's-gardens, Windsor.*
1862	Holland, Robert, Esq. *Stanmore-hall, Great Stanmore, Middlesex.*
1868	1090Holland, Major T. J., C.B. *Topo. Dept., War-office; Tremayne, Thicket-road, Upper Norwood; East India U.S. Club; and Civil of Western India, Poona.*
1861	*Hollingsworth, John, Esq., M.R.C.S. *Maudenstone-house, Greenwich, S.E.*
1871	Hollingworth, Hy. Geo., Esq. *Kin Kiang, China; and Wavertree, Liverpool.*
1861	Holme, J. Wilson, Esq., M.A. *Domswood, Beckenham, Kent, S.E.*
1835	*Holmes, James, Esq. 21, *Holland-villas-road, Kensington, W.*
1839	*Holroyd, Arthur Todd, Esq., M.D., F.L.S. *Master's-office, Sydney, New South Wales. Care of Edgar Howell, Esq., 3, St. Paul's-churchyard, E.C.*

Year of Election.	
1857	Holroyd, Henry, Esq., Barrister-at-Law. 2, *Elm-court, Temple, E.C.*
1867	*Holstein, The Marquez de Souza. *Lisbon. Care of Messrs. Kraentler and Mieville*, 12, *Angel-court, E.C.*
1869	Holt, George, Esq. *Union-street. Willenhall.*
1871	Holt, Henry T. W., Esq. 6, *King's-road, Clapham-park.*
1864	1100Holt, Vesey, Esq. 17, *Whitehall-place, S.W.*
1857	Homfray, William Henry, Esq. 6, *Storey's-gate, S.W.*
1864	*Hood, Sir Alex. Acland, Bart. *St. Andrie's-park, Bridgewater, Somerset.*
1862	Hood, Henry Schuback, Esq. *War-office, S.W.; and* 10, *Kensington-park-gardens, W.*
1859	*Hood, William Charles, Esq., M.D. *Bethlehem-hospital, S.*
1866	*Hooker, Joseph, Esq., C.B., M.D., F.R.S., F.L.S., &c. *Director of the Royal Gardens, Kew.*
1868	Hooper, Alf., Esq. *City of London Club, Old Broad-street, E.C.*
1870	Hooper, George Norgate, Esq. 139, *King Henry's-road, Adelaide-road, N.W.*
1870	Hooper, Rev. Robert Poole. 29, *Cambridge-street, Brighton.*
1861	Hopcraft, George, Esq. 3, *Billiter-square, E.C.*
1846	1110*Hope, Alex. James Beresford, Esq., M.P. *Arklow-house, Connaught-place, Hyde-park, W.; and Bedgebury-park, Hurst-green, Kent.*
1862	Hope, Capt. C. Webley, R.N. *H.M.S. 'Brisk,' Australia; Messrs. Hallett & Co.*
1869	Hopkins, Capt. David. *New Calabar, near Bonny, W. Africa. Care of the Company of African Merchants, 6, Water-street, Liverpool.*
1870	*Hopkins, Edward M., Esq. 66, *Great Cumberland-place, Hyde-park, W.*
1871	Hornby, Rev. James John, D.D. *Head Master of Eton-college.*
1869	Horne, Charles, Esq., H.M. Ind. Civ. Serv. "*Innisfail,*" *Beulah-hill, Upper Norwood.*
1871	Horne, Francis, Esq. *Berrybands, Surbiton.*
1869	Horrex, Theophilus, Esq. 18, *Connaught-square, Hyde-park, W.*
1868	Horton, James Africanus B., Esq., M.D., &c. *Care of Messrs. McGregor and Co., 25, Charles-street, S.W.*
1870	Hoseason, Captain John C., R.N. *United Service Club, S.W.*
1861	1120Hoskins, Capt. A. H., R.N. *Army and Navy Club, S.W. Care of Messrs. Woodhead.*
1859	Hoskyns, Chandos Wren, Esq. *Wraxhall-abbey, Warwickshire.*
1853	Houghton, Lord, F.R.S. *Travellers' Club, S.W.; The Hall, Bawtry; and Fryston-hall, Ferrybridge, Yorkshire.*
1856	Hovell, William Hilton, Esq. *Goulburn, New South Wales. Care of Mr. W. Chamberlin,* 74, *Fleet-street, E.C.*
1869	Howard, John, Esq., C.E. *Exmouth, Devon.*
1853	Howard, Sir Ralph, Bart. 17, *Belgrave-sq., S.W.; and Bushy-park, Wicklow.*
1857	Howard, Samuel Lloyd, Esq. *Goldings, Loughton, Essex.*
1864	Howell, W. G., Esq.
1842	*Hubbard, J. Gellibrand, Esq. 24, *Prince's-gate, Hyde-park, W.*
1867	*Hubbard, William Egerton, Esq. *St. Leonard's-Lodge, Horsham.*

Year of Election.	
1867	1130*Hubbard, William Egerton, Esq., jun., R.A. *St. Leonard's-lodge, Horsham.*
1871	Hudleston, Wilfred, Esq. 23, *Cheyne-walk, S.W.; and Umberleigh, Barnstaple.*
1870	Hudson, George B., Esq. *Frogmore-hall, Hertford. New University Club, St. James's-street, S.W.*
1857	Hughes, Captain Sir Frederic. *Ely-house, Wexford.*
1838	Hughes, William, Esq. 4, *Lawford-road, Kentish-town, N.W.*
1838	*Hume, Edmund Kent, Esq.
1860	*Hume, Hamilton, Esq. *Cooma Yass, New South Wales. Care of Rev. A Hume, All Souls'-vicarage, Liverpool.*
1861	Hunt, George S. Lennox, Esq., H.B.M. Consul, *Rio de Janeiro.*
1868	Hunt, John Percival, Esq., M.D. *Great Ouseburn, near York, Yorkshire.*
1866	Hunt, Joseph, Esq. *Cave-house, Uxbridge, Middlesex.*
1865	1140Hunt, Captain Thomas, R.H.A. *The Barracks, Maidstone.*
1857	Hunt, Zacharias Daniel, Esq. *Aylesbury.*
1868	Hunter, Major Edward. *Junior United Service Club, S.W.*
1862	Hunter, Henry Lannoy, Esq. *Beech-hill, Reading.*
1872	Hutchins, F. Leigh, Esq. *Eltham, Kent, S.E.*
1870	Hutchins, Edward, Esq. 10, *Portland-place, W.*
1871	Hutchinson, Capt. Alexr. Hadden, R.A., F.G.S., Garrison Instructor. *Aldershot.*
1864	Hutchinson, Capt. R. R. *Junior St. James's Club, St. James's-street, S.W.*
1858	Hutchinson, Thomas J., Esq., F.R.S.L., F.E.S., F.A.S.L., H.B.M. Consul, *Callao, Peru.*
1870	*Hutton, Charles W. C., Esq. *Belair, Dulwich, S.*
1869	1150Huxley, Thomas H., Esq., F.R.S., &c. 26, *Abbey-place, St. John's-wood, N.W.*
1860	*Hyde, Captain Samuel. 8, *Billiter-square, E.C.*
1865	Illingworth, Rev. Edward A. *Care of F. Illingworth, Esq., Union Bank, Argyll-place, W.*
1852	Illingworth, Richard Stonhewer, Esq. 9, *Norfolk-crescent, Hyde-park, W.*
1850	*Imray, James Frederick, Esq. 89, *Minories, E.; and Beckenham, Kent, S.E.*
1867	Ince, Joseph, Esq., F.L.S., &c. &c. 36, *Addison-road, Kensington, W.*
1861	*Ingall, Samuel, Esq. *Forest-hill, Kent, S.E.*
1851	Inglefield, Admiral Edward A., C.B., F.R.S. *United Service Club, S.W.; and* 10, *Grove-end-road, St. John's-wood, N.W.*
1871	Inglis, Commander Charles D., R.N. 7, *Albemarle-street, W.*
1846	Ingram, Hughes Francis, Esq. *University Club, S.W.*
1869	1160Inman, Robert Matthew, Esq., M.D. *Edinburgh-house, West-street, Brighton.*
1860	*Inskip, Staff Commander G. H., R.N. *H.M. Surveying Vessel 'Porcupine;' and care of Hydrographic-office, S.W.*
1852	*Inskip, Rev. Robert Mills, C.B. 8, *Boon's-place, Plymouth.*
1840	*Irby, Frederick W., Esq. *Athenæum Club, S.W.*
1870	Irvine, James, Esq. 18, *Devonshire-road, Claughton, Cheshire.*
1864	*Irving, John, Esq. *Care of Messrs. Ebsworth and Sons, 2, Gresham-place, Lombard-street, E.C.*

Year of Election	
1853	Irving, Thomas, Esq.
1861	Irwin, James V. H., Esq. 10, *Nottingham-place, Euston-road, N.*
1871	Jackson, Henry, Esq., Lieut. late I.N. (Chief Surveyor of the Province of Wellington). *New Zealand.*
1871	Jackson, Richd. Belgrave, Esq. 16, *Addison-terrace, Kensington, W.*
1866	1170Jackson, Robert Ward, Esq. 28, *Inverness-road, Hyde-park, W.*
1871	Jackson, Thos. Hughes, Esq. *Manor-house, Birkenhead.*
1855	Jackson, William, Esq. 44, *Portland-place, W.*
1871	Jackson, Wm. Chas., Esq. *Universities Club*, 71, *Jermyn-street, S.W.*
1862	Jacomb, Thomas, jun., Esq. 23, *Old Broad-street, Gresham-house, E.C.*
1870	James, William Morris, Esq. 8, *Lyndhurst-road, Hampstead, N.W.*
1857	James, Major-Gen. Sir Henry, R.E., F.R.S. *Director of the Ordnance Survey, Southampton.*
1861	James, William Bosville, Esq. 13, *Blomfield-road, Maida-hill, W.*
1868	Jamieson, Robert Alexander, Esq., M.A. *Shanghai. Care of J. P. Watson, Esq., St. Dunstan's-buildings, St. Dunstan's-hill, E.C.*
1868	Jamieson, Hugh, Esq. *Junior Carlton Club, S.W.*
1862	1180*Jaques, Leonard, Esq. *Wentbridge-house, Pontefract, Yorkshire.*
1863	*Jardine, Andrew, Esq. *Lanrick-castle, Stirling.*
1863	*Jardine, Robert, Esq., M.P. *Castlemilk, Lockerby, N.B.*
1871	Jarrad, Lieut. F. W., R.N., *H.M.S. 'Porcupine,' and Avon-house, Langley-Burrel, near Chippenham.*
1857	Jefferson, Richard, Esq. *A 4, The Albany, W.*
1865	Jeffreys, J. G., Esq., F.R.S. 25, *Devonshire-place, W.*
1860	*Jejeebhoy, Sir Jamsetjee, Bart. *Bombay.*
1854	Jellicoe, Charles, Esq. 12, *Cavendish-place, W.*
1854	Jenkins, Capt. Griffith, I.N., C.B. *East India Club, St. James's-square, S.W.; and Derwen, Welshpool, Montgomeryshire.*
1837	*Jenkins, R. Castle, Esq. *Beachley, near Chepstow.*
1854	1190*Jennings, William, Esq., M.A. 13, *Victoria-street, Westminster, S.W.*
1860	Jermyn, Rowland Formby, Esq. *War-office, S.W.*
1860	Jessopp, Rev. Augustus, M.A., Head Master, King Edward VI. School. *Norwich.*
1870	Jessop, Captain Thomas. 37, *Clarges-street, Piccadilly, W.*
1864	*Jeula, Henry, Esq. *Lloyd's, E.C.*
1871	Johnson, George, Esq., M.D. 11, *Savile-row, W.*
1859	*Johnson, Henry, Esq. *Messrs. Johnson, 7, Bedford-row, Worthing, Sussex.*
1854	Johnson, John Hugh, Esq.
1870	Johnson, T. Scarboro, Esq. 42, *Gloucester-place, Hyde-park, W.*
1866	Johnson, W. H., Esq., Civil Assistant G. T. S. India. *Sealkote, Punjaub.*
1868	1200*Johnston, Alexander Keith, Esq., jun. 74, *Strand, W.C.*
1856	Johnston, A. R., Esq., F.R.S. *Heatherley, Sandhurst, near Wokingham, Berks.*
1857	Johnston, J. Brookes, Esq. 29, *Lombard-street, E.C.*

Year of Election.	
1871	Johnston, T. B., Esq., F.R.S.E. 4, *St. Andrew-square, Edinburgh.*
1868	Johnston, Thomas, Esq. 12, *Belvedere, Bath; and King Edward VI. Grammar-school, Bath.*
1866	Johnstone, Colonel H. C., C.B., F.R.A.S. *Murree, Punjaub, India. Care of Messrs. H. S. King and Co., Cornhill, E.C.*
1867	*Johnstone, John, Esq. *Castelnau-house, Mortlake, S.W.*
1858	Jones, Captain Edward Monckton, 20th Regt. *Royal Military College, Farnborough-station.*
1864	Jones, Captain Felix, late I.N. *Fernside, Church-road, Westow-hill, Upper Norwood, S.*
1868	Jones, Captain H. M., V.C.
1857	1210Jones, Lieut.-Col. Jenkin, Royal Engineers. 1, *Lennard-place, Circus-road, St. John's-wood, N.W.; and India.*
1862	Jones, John, Esq. 338, *Strand, W.C.*
1861	Jones, John Pryce, Esq. *Grove-park-school, Wrexham.*
1871	Jones, Robert, Esq. *The Manor House, St. John's-wood-park, N.W.*
1861	Jones, Sir Willoughby, Bart. *Cranmer-hall, Fakenham, Norfolk.*
1867	*Jordan, Wm. Leighton, Esq. 1, *Pouis-square, Notting-hill, W.*
1863	Joshua, Moss, Esq. *Melbourne.*
1868	Kantzow, Captain H. P. de, R.N. *United Service Club, S.W.*
1858	Kay, David, Esq. 19, *Upper Phillimore-place, Kensington, W.*
1865	Kaye, Sir John W., K.C.S.T., F.R.S. *India-office, S.W.*
1860	1220Keate, R. W., Esq., Lieutenant-Governor, *Trinidad.*
1857	Keating, Hon. Sir Henry Singer, one of the Judges of the Court of Common Pleas. 11, *Prince's-gardens, S.W.*
1857	Keene, Rev. C. E. Ruck. *Swynscombe-park, Henley-upon-Thames.*
1863	Keir, Simon, Esq. *Conservative Club, S.W.*
1845	*Kellett, Rear-Admiral Sir Henry, K.C.B. *Clonmel, Ireland.*
1860	*Kemball, Col. Sir Arnold Burrowes, C.B., Indian Army. *United Service Club, S.W.*
1871	Kemp, Geo. L., Esq., Manager of the Standard Insurance Co. (of England), Calcutta. *Care of Messrs. A. W. Ray and Co.*, 10, *Old Jewry Chambers, E.C.*
1863	Kempster, J., Esq. 1, *Portsmouth-place, Kennington-lane, Surrey, S.*
1861	Kennard, Adam Steinmetz, Esq. 7, *Fenchurch-street, E.C.*
1871	Kennedy, Henry Hyndham, Esq. 5, *Clarendon-place, Hyde-park-gardens, W.*
1854	1230Kennedy, Rev. John, M.A. 4, *Stepney-green, E.*
1871	Kennion, Rev. George Wyndham, B.A. *Doncaster.*
1871	Kenrick, George, Esq. 6, *Percy-villas, Campden-hill, Kensington, W.*
1863	Kerr, J. H., Esq., Staff-Commr. R.N. *Hydrographic-office, S.W.*
1862	Kershaw, Wm., Esq. 16, *St. Mary Axe, E.C.; and Suffolk-lodge, Brixton-road, S.*
1862	Key, J. Binney, Esq. *Oriental Club, W.*
1857	Keysell, Francis P., Esq. *Grove-house, Cheshunt.*

Year of Election.	
1864	*Kiddle, W. W., Esq. *Linton-villa, Clarendon-road, Southsea.*
1864	Kimber, Dr. E. *Murchison-house, Dulwich, S.E.*
1846	King, Lieut.-Colonel Edward R., 36th Regt. *Junior United Service Club, S.W.*
1870	1240King, Henry S., Esq. J.P. 65, *Cornhill, E.C.*; 45, *Pall-mall, S.W.*; *Manor-house, Chigwell, Essex*; and *Junior Carlton Club, S.W.*
1866	King, John, Esq. *Compton-field-place, Guildford, Surrey.*
1872	King, James, Esq. 29, *Claremont-terrace, Glasgow.*
1861	King, Lieut.-Col. W. Ross, Unatt., F.S.A. Scot. *Tertowie, Kinellar, Aberdeen-shire*; and *Army and Navy Club, S.W.*
1868	Kingsley, Henry, Esq.
1857	*Kinnaird, Hon. Arthur F., M.P. 2, *Pall-mall-east, S.W.*
1867	Kinnaird, George William Fox, Lord, K.G. *Rossie-priory, Inchture, N.B.*; and 33, *Grosvenor-street, W.*
1860	Kinns, Samuel, Esq., PH. DR., F.R.A.S. *Highbury-new-park College, N.*
1858	Kirk, John, Esq., M.D. *Care of J. F. Rogers, Esq.*, 25, *South-castle-street, Edinburgh.*
1863	Kirke, John, Esq., Barrister. *C. Thorold, Esq., Welham, Retford, Notts.*
1870	1250Kirkland, Major-Gen. John A. Vesey. 17, *Whitehall-place, S.W.*
1868	Kisch, Daniel Montagu, Esq. 1, *Devonshire-place, Seven Sisters'-road, Upper Holloway, N.*
1866	*Kitson, James, jun., Esq. *Hanover-square, Leeds.*
1868	Kitto, Richard L. Middleton, Esq. *Church-hill-villa, Fryerstown, Victoria, Australia.*
1835	*Kjaer, Thomas Andreas, Esq. *Gathersgaden* No. 26, *Copenhagen.*
1867	Knight, Andrew Halley, Esq. *Care of R. Philpott, Esq.*, 3, *Abchurch-lane, E.C.*
1862	Knollys, Lieut.-General Sir William T., K.C.B., V.-Pres. Council of Military Education. *Eaton-square, S.W.*
1871	Knollys, Major W. W. (93rd Highlanders). *Guards' Club, S.W.*
1867	Knox, Alex. A., Esq. 91, *Victoria-street, Westminster, S.W.*
1861	Knox, Thomas G., Esq. *India. Care of Messrs. H. S. King and Co.*, 45, *Pall-mall, S.W.*
1866	1260Kopsch, Henry, Esq. *Custom-house, Shanghai. Care of H. C. Batchelor, Esq.*, 155, *Cannon-street, E.C.*
1861	Kyd, Hayes, Esq., M.R.C.S. *Wadebridge, Cornwall.*
1859	Labrow, Lieut.-Colonel Valentine H., F.S.A., F.G.S. *Mitre-court-chambers, Temple, E.C.*; *and Club-chambers, S.W.*
1870	Lackersteen, Mark H., Esq., M.D., &c. 29, *Queen Anne-st., Cavendish-sq., W.*
1849	*Laffan, Colonel Robert Michael, R.E. *Army and Navy Club, S.W.*; *and Otham-lodge, Kent.*
1870	Laing, Arthur, Esq. 18, *Kensington-gardens-square, Hyde-park, W.*
1869	Lamb, Hon. Edward William. *Brisbane, Queensland, Australia.*
1859	Lamb, Lieut. Henry, I.N. *H.M. India Store Department, Belvedere-road, Lambeth, S.*
1863	*Lambert, Alan, Esq. *Heath-lodge, Putney-heath, S.W.*

Year of Elect on	
1864	Lambert, Charles, Esq. 2, *Queen-street-place, Upper Thames-street, E.C.*
1867	1270Lambert, Wm. Blake, Esq., C.E. 3, *Morden-road, Blackheath, S.E.*
1861	Lamont, James, Esq. *Gartmore-house, Stirling.*
1870	Lamplough, Charles Edward, Esq. *City of London Club, E.C.*
1866	Lampray, John, Esq. 16, *Camden-square, N.W.*
1867	Lampley, Jones, Esq., M.B., Surgeon-Major 67th Regiment.
1864	Lampson, Sir C. M., Bart. 64, *Queen-street, Cheapside, E.C.*
1838	*Lance, John Henry, Esq., F.L.S. *The Holmwood, Dorking.*
1861	*Lang, Andrew, Esq. *Dunmore, Hunter-river, New South Wales; and Dunmore, Teignmouth, Devon.*
1859	*Lange, Sir Daniel A. 21, *Regent-street, W.*
1865	Langley, Edward, Esq. *Well-hall, Eltham, Kent.*
1856	1280*Langler, John R., Esq., B.A. *Wesleyan Training College, Westminster; and Gothic-villas, 2, Bridge-road-west, Battersea, S.W.*
1871	Langworthy, Edward, Esq. *Gap-house, Holyport, Maidenhead.*
1870	Lanyon, Charles, Esq. 3, *Paper-buildings, Temple, E.C.*
1853	*Larcom, Major-General Sir Thomas Aiskew, R.E., K.C.B., F.R.S. *Heathfield, Fareham, Hants,*
1861	Lardner, Colonel John. *United Service Club, S.W.*
1859	Larnach, Donald, Esq. 21, *Kensington-palace-gardens, W.*
1870	Lasseter, Frederic, Esq. *Sydney, New South Wales; and* 3, *Belsize-park, N.W.*
1854	Latrobe, Ch. J., Esq. *Clapham-house, Lewes, Sussex.*
1870	Laughton, Lieut.-Col. George Arnold (Bombay Staff Corps). *Superintendent Bombay Survey, Bombay.*
1869	Laughton, J. K., Esq. *Denton-house, Victoria-road, Southsea; and Royal Naval College, Portsmouth.*
1846	1290*Law, Hon. H. Spencer, M.A. 40, *Eaton-place, S.W.*
1870	Lawrence, Alexander, Esq. *Clyde-house, Thurlow-road, Hampstead; and Windsor-chambers, Great St. Helen's, E.C.*
1870	*Lawrence, Philip Henry, Esq. 12, *Whitehall-place, S.W.*
1870	Lawrence, Lord, G.C.B. 26, *Queen's-gate, W.*
1868	Lawrie, James, Esq. 63, *Old Broad-street, E.C.*
1867	Lawson, William, Esq. 21, *Waltham-grove, Fulham, S.W.*
1862	*Lay, Horatio N., Esq.
1857	Layard, Right Hon. Austen H., D.C.L. 130, *Piccadilly, W.*
1866	*Layard, Captain Brownlow Villiers (3rd W. India Regt.). *Junior United Service Club; and* 38, *Upper Mount-street, Dublin.*
1868	Laybourne, Augustine, Esq. 9, *King-street, Finsbury-square, E.C.; and Loughton, Essex.*
1863	1300*Leaf, Charles J., Esq. *Old-change, E.C.; and The Rylands, Norwood, S.*
1869	*Leaf, F. H., Esq. *Burlington-lodge, Streatham-common, S.W.*
1866	Lebour, G. A., Esq. 28, *Jermyn-street, S.W.*
1853	*Le Breton, Francis, Esq. 21, *Sussex-place, Regent's-park, N.W.*

Year of Election.	
1861	Leckie, Patrick C., Esq. 7, *Palace-road, Roupell-park, Streatham, S.*
1870	Lecky, Squire Thornton Stratford, Esq., Lt. Royal Naval Reserve. 47, *Aubrey-street, Everton, Liverpool.*
1868	Lee, John, Esq. 62, *Loughborough-park, S.*
1839	Lee, Thomas, Esq. *Royal Institution, Albemarle-street, W.*
1869	*Lees, Lieutenant-Colonel Nassau, D.C.L. *Athenæum Club, S.W.*
1865	Le Feuvre, W. H., Esq., C.E. 68, *Bedford-gardens, Kensington, W.*
1833	1310*Lefevre, Sir John George Shaw, M.A., D.C.L., F.R.S., Vice-Chancellor of the University of London. 18, *Spring-gardens, S.W.*
1853	Lefroy, General John Henry, R.A., F.R.S. 82, *Queen's-gate, W.*
1862	Leggatt, Clement Davidson, Esq. 43, *Inverness-terrace, W.*
1861	Legh, Wm. John, Esq. 38, *Belgrave-square, S.W.; and Lyme-park, Cheshire.*
1861	*Lehmann, Frederick, Esq.
1845	Leigh, John Studdy, Esq., F.G.S. 6, *Talbot-road, Westbourne-park, W.*
1869	Leigh, Roger, Esq. *Barham-court; and Hindley-hall, Hindley.*
1863	Le Mesurier, Henry P., Esq., C.E. *St. Martin's, Guernsey.*
1863	Le Messurier, Major-Gen. A. P. 2, *Stanhope-terrace, Hyde-park, W.*
1856	Leslie, The Hon. G. W. 4, *Harley-street, W.*
1867	1320L'Estrange, Carleton, Esq. *Carlton Club, S.W.*
1840	*Letts, Thomas, Esq. *South-view-house, Blackgang, Isle of Wight.*
1857	Leverson, George B. C., Esq. 73, *Gloucester-terrace, Hyde-park, W.*
1871	Levert, Arthur Lionel, Esq. *Naval and Military Club, Piccadilly, W.*
1869	Leveson, Edward J., Esq. *Cluny, Crescent-wood-road, Sydenham-hill, S.E.*
1866	Levinge-Swift, Richard, Esq. *Levinge-lodge, Richmond, Surrey.*
1859	Levinsohn, Louis, Esq. *Vernon-house, Clarendon-gardens, Maida-hill, W.*
1865	Levy, William Hanks, Esq. *Institution of the Association for Promoting the Welfare of the Blind*, 210, *Oxford-street, W.*
1869	*Lewin, Capt. Thomas (Beng. Staff Corps). *East India United Service Club, S.W.*
1852	Leycester, Captain Edmund M., R.N. 18, *Castelnau-villas, Barnes, Surrey.*
1861	1330Leyland, Luke Swallow, Esq. *The Leylands, Hatfield, Doncaster.*
1859	Lichfield, Thomas George, Earl of. *Shugborough, Staffordshire.*
1872	Liebenrood, Captain J., R.N. *Belmont-lodge, Lee, Kent.*
1869	Ligar, C. W., Esq., Surveyor-General of Victoria. 4, *Royal Exchange-avenue, E.C.; and Melbourne, Australia.*
1870	Light, Rev. John. 13, *Notting-hill-terrace, W.*
1856	Lilford, Thomas Lyttleton Powys, Lord. 10, *Grosvenor-place, W.*
1860	Lindsay, H. Hamilton, Esq.
1857	Lindsay, Major-General the Hon. J., Grenadier Guards, M.P. 20, *Portman-square, W.*
1870	Lindsay, James, Lord. 47, *Brook-street, Grosvenor-square, W.*
1867	*Lindsay, Colonel Robert J. L., M.P., V.C. *Lockinge-house, Wantage, Berks; and 2, Carlton-gardens, S.W.*
1855	1340*Lindsay, William S., Esq. *Manor-house, Shepperton, Middlesex.*
1869	Lindsey, Mark John, Esq. 32, *Ludgate-hill, E.C.; and Burnt-ash-lane, Lee, Kent.*

Year of Election.	
1868	Linton, Robert P., Esq., F.R.C.S., M.R.I. 14, *St. James's-square, S.W.*
1866	Little, Archibald J., Esq. 71, *Brook-street, Grosvenor-square, W.*
1871	Little, Simon, Esq. *Calantra-house, Wexford, Ireland.*
1870	Littleton, The Hon. Henry S. *Teddesley, Penkridge, Staffordshire.*
1869	Livingstone, Charles, Esq.
1857	*Lloyd, George A., Esq. *George-yard, Lombard-street, E.C.*
1863	Lloyd, Sir Thomas Davis, Bart. *United University Club, S.W.; and Bronwydd, Carmarthen.*
1864	*Lloyd, W., Esq. *Myood House, Wednesbury, Staffordshire.*
1867	1350Lloyd, Rev. William V., M.A. 16, *Lancaster-gate, W.*
1861	Lluellyn, Capt. Richard. 20, *Montagu-square, W.*
1869	Lluellyn, Captain William R., R.A. *Army and Navy Club, S.W.*
1868	Lobley, James L., Esq. 59, *Clarendon-road, W.*
1863	Loch, George, Esq. 12, *Albemarle-street, W.*
1859	Loch, Henry Brougham, Esq. *Government-house, Isle of Man.*
1861	Loch, John Charles, Esq. 12, *Albemarle-street, W.; and Hong-Kong.*
1857	Loch, William Adam, Esq. 8, *Great George-street, Westminster, S.W.*
1864	Locke, John, Esq. 83, *Addison-road, Kensington, W.*
1858	Lockhart, William, Esq., F.R.C.S. *Park-villas, Granville-park, Blackheath, S.E.; and China.*
1868	1360Lockhart, Captain Wm. Stephen Alexander.
1860	Lockwood, James Alfred. *United Arts Club, Hanover-square, W.*
1856	*Logan, Sir William Edmond, F.R.S. *Montreal, Canada*
1868	Lomonossoff, M. Alexis de. *Irkoutsk, East Siberia.*
1860	Londesborough, Wm. Henry Forester, Lord. 3, *Grosvenor-square, W.*
1830	*Long, George, Esq., M.A. 2, *Rhine-villas, Portfield, Chichester.*
1857	*Long, W. Beeston, Esq.
1858	Longden, Morrell D., Esq. 4, *Ennismore-place, Hyde-park, S.W.*
1865	*Longley, Major George, R.E. 60, *Prince's-gate, W.*
1847	Longman, Thos., Esq. *Paternoster-row, E.C.; and* 8, *Sussex-sq., Hyde-park, W.*
1858	1370Longman, William, Esq. 36, *Hyde-park-square, W.*
1870	*Longstaff, Capt. Llewellyn Wood. *Ganstead Hall, Hull.*
1861	Lonsdale, Arthur Pemberton, Esq.
1860	Looker, William Robert, Esq. *Melbourne, Australia. Care of Mr. Ashhurst, 16, Bishopsgate-street-within, E.C.*
1864	Lothian, William Schomberg, Marquis of. 15, *Bruton-street, W.*
1856	Lovett, Phillips Cosby, Esq. *Liscombe-ho., Liscombe, Leighton Buzzard, Bucks.*
1867	Low, Alex. F., Esq. 84, *Westbourne-terrace, W.*
1863	Low, S. P., Esq. 55, *Parliament-street, S.W.*
1858	Lowden, Rev. George Rouse. *St. Leonard-villa, Hanwell, Middlesex.*
1859	Lowe, Captain W. Drury. *Myria, Bettws-y-Coed, Llanrwst, North Wales.*
1863	1380Lowndes, E. C., Esq. 84, *Eaton-place, S.W.*
1830	Lowry, Joseph Wilson, Esq. 39, *Robert-street, Hampstead-road, N.W.*

Year of Election	
1860	Loyd, Colonel W. K. *Union Club, S.W.*
1870	Luard, Captain Charles Edward, R.E. *Gibraltar.*
1866	Luard, Wm. Charles, Esq. *Llandaff-house, Cardiff; and Athenæum Club, S.W.*
1871	*Lubbock, Sir John, Bart, M.P., F.R.S., &c. *High-elms, Beckenham, Kent.*
1871	Ludlow, Edgar John David, Esq. 102, *Jermyn-street, S.W.*
1860	Lumsden, Rev. Robert Comyn, M.A. *Park-cottage, Ramsbottom, Manchester.*
1860	Lush, Sir Robert, Q.C. *Balmoral-house, Avenue-road, Regent's-park, N.W.*
1870	Lyall, George, Esq. 73, *Eaton-place, S.W.; and Hedley, near Epsom.*
1866	1390Lydall, J. H., Esq. 12, *Southampton-buildings, Chancery-lane, W.C.*
1869	Lye, John Gaunt, Esq. 18, *Prince of Wales-terrace, Kensington, W.*
1830	*Lyell, Sir Charles, Bart., M.A., LL.D., F.R.S. 73, *Harley-st., Cavendish-sq., W.*
1837	*Lynch, Captain H. Blosse, I.N., C.B., F.R.A.S. *Athenæum Club, S.W.*
1861	*Lynch, Thomas Kerr, Esq. 31, *Cleveland-square, Hyde-park, W.*
1858	Lyne, Francis, Esq. 12, *Blomfield-terrace, Harrow-road, W.*
1871	Lyveden, Robert Vernon, Lord. 20, *Savile Row, W.*
1862	*Macarthur, Major-Gen. Sir Edward, K.C.B. 27, *Prince's-gardens, W.*
1863	Macbraire, James, Esq. *Broadmeadows, Berwick-on-Tweed.*
1862	Macdonald, Chessborough C., Esq. 32, *Belsize-park, Hampstead, N.W.*
1871	1400Macdonald, William, Esq. *St. Patrick's-lodge, Granville-park, Lewisham, S.E.; and Yokohama, Japan.*
1843	Macdonnell, Sir Richard Graves, C.B.
1865	Macfarlan, John G., Esq. *Locksley, Victoria-road, Gipsy-hill, S.E.*
1865	Macfie, Rev. M. *Moseley-road, Birmingham.*
1868	MacGregor, Lieut.-Col. C. M. *Bengal. Care of Messrs. H. S. King and Co., 65, Cornhill, E.C.*
1861	Mackintosh, Alexander Brodie, Esq. *Oriental Club, W.; and Dunoon, Scotland.*
1845	*Macintyre, Patrick, Esq., F.S.A., Off. Assoc. Inst. Act. 1, *Maida-hill, W.*
1868	Mackay, Dr. A. E., R.N. *Admiralty, Somerset-house, W.C.*
1859	Mackay, Rev. Alexander, LL.D. 1, *Hatton-place, Grange, Edinburgh.*
1870	Mackay, Nevile F., Esq. 2, *Elm-court, Temple, E.C.*
1859	1410*Mackean, Thos. W. L., Esq. *Bank of British Columbia, 5, East India-avenue.*
1845	Mackenzie, Right Hon. Holt, F.R.A.S. *Athenæum Club, S.W.; and 28, Wimpole-street, W.*
1860	*Mackenzie, James T., Esq. 69, *Lombard-street, E.C.*
1863	Mackenzie, John H., Esq. *Wallington, Carshalton, Surrey.*
1864	*Mackeson, Edward, Esq. 59, *Lincoln's-inn-fields, W.C.*
1862	Mackinlay, D., Esq. *Oriental Club, W.*
1867	Mackinlay, John, Esq., J.P., M.I.C.E., Chief Engineer and Inspector of Machinery, H.M. Dockyard, and Surveyor to the Port, Bombay. *Care of Charles Bannerman, Esq., 193, Camberwell-new-road, Kennington, S.*
1864	Mackinnon, C. D., Esq. *Care of Messrs. J. Clinch and Sons, 31, Abchurch-lane, E.C.*
1855	*Mackinnon, Wm. Alex., Esq., M.P., F.R.S. 4, *Hyde-park-place, W.*
1865	*Mackinnon, W., Esq. *Balinakiel-by-Harbert, Argyleshire.*

Year of Election.

1860 1420Mackirdy, Major-Gen. Elliot, 69th Regiment. *U. S. Club, S. W.*
1871 Maclagan, Colonel Robert, R.E. *Care of Messrs. Cranford, Colvin, and Co., 71, Old Broad Street, E.C.*
1860 Maclean, William Crighton, Esq., F.G.S. 31, *Camperdown-pl., Great Yarmouth.*
1859 MacLeay, George, Esq. *Pendell-court, Bletchingley.*
1870 MacLeod, Lieut. Angus, R.N. *Royal Naval College, Portsmouth.*
1871 McLeod, Sir Donald Friell, K.C.S.I., C.B., &c. 1, *Charendon-road, S. Kensington, W.*
1855 Maclure, Andrew, Esq. *Maclure, Macdonald, and Macgregor, 37, Walbrook, E.C.*
1861 Maclure, John William, Esq. *Fallowfield, near Manchester.*
1860 Macmillan, Alex., Esq. 16, *Bedford-street, Covent-garden, W.C.*
1871 Macnab, Duncan Macpherson, Esq. *Union Club, S. W.*
1855 1430Macnab, John, Esq. *Findlater-lodge, Trinity, near Edinburgh.*
1868 Macnair, George, Esq. *Oriental Club, Hanover-square, W.*
1871 Macpherson, Daniel, Esq. *Cadiz; and* 1, *King-street, St. James's, S. W.*
1871 Macpherson, Hugh Martin, Esq. *E. I. United Service Club, S. W.*
1861 Macpherson, William, Esq. *Rustic-house, Putney.*
1870 Macturk, John, Esq. *Tillicoultry.*
1871 MacVicar, Jno. A., Esq., Lt. 93rd Highlanders. 9, *Sussex-pl., Regent's-pk., N. W.*
1863 McArthur, Alex., Esq. *Ralcigh-hall, Brixton-rise, Brixton, S.*
1867 McArthur, William, Esq. 1, *Guyder-houses, Brixton-rise, S.*
1860 McClintock, Admiral Sir Francis Leopold, R.N., F.R.S. *United Service Club, S. W.; and* 2, *Eaton-terrace, W.*
1861 1440*McConnell, W. R., Esq., Barrister-at-Law. 12, *King's-Bench-walk, Temple, E.C.; and Charleville, Belfast.*
1862 McCosh, John, Esq., M.D. *Junior United Service Club, S. W.*
1855 *M'Clure, Admiral Sir Robert J. le M., C.B. *Chipperfield, Herts; and Athenæum Club, S. W.*
1865 McDonald, James, Esq. *Oriental Club, Hanover-square, W.*
1865 McEuen, D. P., Esq. 24, *Pembridge-square, Bayswater, W.*
1855 McGregor, Duncan, Esq. *Board of Trade, S. W.; and Athenæum Club, S. W.*
1867 McGregor, Duncan, Esq. *Clyde-place, Glasgow.*
1869 McGrigor, Alexander Bennett, Esq. 19, *Woodside-terrace, Glasgow.*
1866 *McIvor, W. G., Esq., *Sup. of Chinchona Plantations, Ootacamund, Madras.*
1858 McKerrell, Robert, Esq. 45, *Inverness-terrace, W.; and Mauritius.*
1868 1450M'Clean, Frank, Esq., M.A., C.E. *Ferncliffe, Tunbridge Wells.*
1867 *McLean, Hon. John. *Oamaru, New Zealand. Care of Messrs. Redfern, Alexander, and Co.*, 3, *Great Winchester-street-buildings, E.C.*
1870 McLeod, Major-Gen. W. C. 14, *St. James's-square, S. W.*
1852 M'Leod, Walter, Esq. *Head Master of the Royal Military Asylum, Chelsea, S. W.*
1871 *McClure, Joseph Henry, Esq. 2, *Woodland-terrace, Manchester.*
1866 McNair, Captain John F. A., R.A.
1839 M'Neil, The Right Hon. Sir John, G.C.B. *Granton, near Edinburgh.*
1859 Maitland, Geo. Gammie, Esq. *Shotover-house, Wheatley, Oxon.*
1871 Major, Henry, Esq., B.A. *Sherwood-house, Mansfield-road, Nottingham.*

Year of Election.	
1845	*Major, Richard Henry, Esq., F.S.A. *British Museum, W.C.*
1868	1460*Makins, Henry F., Esq. 19, *Prince of Wales-terrace, Kensington-palace, W., and Reform Club, S.W.*
1858	Malby, John Walter, Esq. 15, *Richmond-villas, Seven-sisters'-rd., Holloway, N.*
1853	*Malby, Thomas, Esq. 2, *Park-villas, Seven-sisters'-road, Holloway, N.*
1862	*Malcolm, Captain Edward Donald, R.E. *Chatham.*
1863	Malcolm, James, Esq. 22, *Prince's-gate, Knightsbridge, W.*
1843	*Malcolm, W. E., Esq. *Burnfoot, Langholme, near Carlisle.*
1853	*Mallet, Chas., Esq. *Audit-office, W.C.; and 7, Queensbro'-ter., Bayswater, W.*
1871	Maltzan, The Baron H. de. 2, *Albertstrasse, Wiesbaden. Care of Messrs. Langstaff, Ehrenberg, and Co., 60, King William-street, E.C.*
1870	Man, Captain J. Alexander (Commissioner of Customs for Formosa, &c.) *Care of P. J. King, Esq., 16, Stanley-crescent, Kensington-park, W.*
1860	Mann, James Alexander, Esq., M.R.A.S. *Sluch-villa, Brecon; and Kensington-palace-avenue, W.*
1866	1470Mann, Robert James, Esq., M.D. 4, *Belmont-villas, Surbiton-hill, and 6, Duke-street, Adelphi, W.C.*
1866	Manners, George, Esq., F.S.A. *Lansdowne-road, Croydon.*
1868	Manners-Sutton, Graham, Esq., 7, *Gloucester-terrace, Hyde-park, W.*
1856	Manning, Frederick, Esq. *Byron-lodge, Leamington; and 8, Dover-street, W.*
1864	*Mansell, Captain A. L. *Hydrographic-office, Admiralty, S.W.*
1869	Mantell, Sir John Iles. *Swinton-park, Manchester; and Windham Club, S.W.*
1859	Mantell, Walter Baldock Durant, Esq. *Wellington, New Zealand. Care of E. Stanford, Esq.*
1869	March, Edward Bernard, Esq., H.M. Consul, Fiji Islands. 12, *Buckingham-street, Strand, W.C.*
1871	Mergetts, William G., Esq. *Allamira, Stonebridge, Willesden, N.W.*
1860	Mariette, Prof. Alphonse, M.A. 27, *St. Stephen's-square, Bayswater, W.*
1854	1480Markham, Clements Robert, Esq., C.B. *India-office, S.W.; 21, Eccleston-sq., S.W.; and Athenæum Club, S.W.*
1857	Marlborough, George, Duke of. *Blenheim, Woodstock. Care of E. Stanford, Esq.*
1864	Marsden, Rev. Canon J. H. *Higher Broughton, Manchester.*
1857	Marsh, Matthew Henry, Esq. *Oxford and Cambridge Club, S.W.; and 41, Rutland-gate, S.W.*
1870	*Marsh, Rev. W. R. Tilson, M.A. *Oxford and Cambridge Club, S.W.; Conservative Club; and Strethom-manor, Isle of Ely.*
1862	Marshall, Captain J. G. Don. 6, *The Mount, St. Leonards-on-Sea.*
1854	Marshall, James Garth, Esq. *Headingley, near Leeds; and Monk Coniston, Ambleside.*
1862	Marshall, William, Esq. 71, *Mornington-road, W.*
1859	*Marsham, The Hon. Robert. 5, *Chesterfield-street, Mayfair, W.*
1857	Marshman, J. C., Esq. 7, *Kensington-palace-gardens, W.*
1871	1490Marten, Elliott, Esq., Vice-Cons. Sarawak. *Care of W. T. Marten, Esq., 30, Great St. Helen's, E.C.*
1857	Martin, Francis P. B., Esq.

Year of Election.	
1861	Martin, Henry, Esq. *Sussex-house, Highbury-new-park, N.*
1860	*Martin, Richard Biddulph, Esq. *Clarewood, Bickley, S.E.*
1862	Martin, Thomas, Esq. 5, *Compton-terrace, N.*
1867	Martin, William, Esq.
1870	Martin, Wm. Coleman, Esq. *Shireoaks, Worksop, Notts.*
1870	*Martindale, William, Esq. 66, *Upper Thames-street, E.C.; Gresham Club, E.C.; and Gainsborough Lodge, Leytonstone, Essex.*
1871	Master, Charles Hoskins, Esq. *Barrow-green House, Oxted, near Godstone, Surrey.*
1870	Masterman, Edward, Esq. 30, *Threadneedle-street, E.C.; and* 27, *Clement's-lane, Lombard-street, E.C.*
1870	1500Masterman, Edward, jun. Esq. 57½, *Old Broad-street, E.C.; and Walthamstow.*
1869	*Matheson, Alexander, Esq., M.P. 33, *South-street, Park-lane, W.; and Ardross Castle, Ross-shire, N.B.*
1845	*Matheson, Sir James, Bart., F.R.S. 13, *Cleveland-row, S.W.; and Achany, Bonar-bridge, Sutherlandshire, &c.*
1871	Mathew, George Buckley, Esq. *Care of Messrs. Boddington and Co., St. Helen's-place, E.C.*
1858	Mathieson, James Ewing, Esq. 77, *Lombard-street, E.C.; and* 16, *Queen's-gardens, Bayswater, W.*
1869	Maude, Col. Francis Cornwallis, R.A., V.C., &c. *Army and Navy Club, S.W.*
1868	Mavrogordato, M. Lucas. *Belgrave-mansions, Grosvenor-gardens, S.W.; and Messrs. Ralli, Brothers, 25, Finsbury-circus, E.C.*
1871	Mawbey, Henry, Esq. 12, *Clare-road, Cotham, Bristol.*
1860	*Maxwell, Sir William Stirling, Bart. 10, *Upper Grosvenor-street, W.; and Keir, Dunblane, N.B.*
1855	May, Daniel John, Esq., R.N., Staff-Commr. *Care of Case and Loudensack.*
1858	1510Mayer, Joseph, Esq., F.S.A. 68, *Lord-street, Liverpool.*
1861	Mayers, William S. F., Esq., Interpreter to H.M. Consulate. *Shanghai. Care of F. J. Angier, Esq.*, 12, *George-yard, Lombard-street, E.C.*
1862	Mayne, Captain Richard Charles, R.N., C.B. 80, *Chester-square, S.W.*
1858	Mayo, Captain John Pole. *Army and Navy Club, S.W.*
1867	Mayson, John S., Esq., J.P. 25, *Dickinson-street, Manchester.*
1863	Meade, The Hon. Robert Henry. *Foreign-office, S.W.: and* 3, *Belgrave-sq., S.W.*
1871	Medhurst, W. H., Esq. 122, *Queen's-road, Bayswater; and Athenæum Club.*
1862	*Medlycott, Commander Mervyn B., R.N. *Care of Messrs. Woodhead.*
1854	Melvill, Major-Gen. Sir Peter Melvill, Mil. Sec. to the Bombay Gov. 27, *Palmeira-square, Brighton.*
1838	Melvill, Philip, Esq., F.R.A.S. *Ethy-house, Lostwithiel, Cornwall.*
1871	1520Mercer, Henry, Esq., B.A. *Uxbridge.*
1868	Merewether, Colonel Sir William Lockyer, K.C.S.I., C.B. *Kurrachee.*
1842	*Merivale, Herman, Esq., C.B., Under Sec. of State for India. *India-office, S.W.; and* 13, *Cornwall-gardens, South Kensington, W.*
1871	Merritt, Douglas, Esq. *Lyndhurst, Irvington-on-Hudson, New York, U.S. Care of H. T. Thorlock, Esq.*, 9, *Canning-place, Liverpool.*

Year of Election.	
1871	Messam, Josiah Young, Esq., R.N. (Controller of H.M.'s Packet Service). *General Post-office, E.C.; and Bedford-villa, Sydenham-road, Croydon.*
1866	Messiter, Charles A., Esq. *Barwick, near Yeovil, Somerset.*
1867	Metcalfe, Frederic Morehouse, Esq. *Wisbech, Cambridgeshire.*
1871	Methven, Captain Robert. 44, *Chester-square, S.W.*
1837	*Mexborough, John Chas. Geo., Earl of. 33, *Dover-street, W.; and Methley-park, near Leeds.*
1865	*Michell, Lieut.-Colonel J. E., R.H.A.
1868	1530Michell, Robert, Esq. 17, *King-street, St. James's, S.W.*
1863	*Michie, A., Esq. 26, *Austin-friars, E.C.*
1848	Middleton, Rear-Admiral Sir G.N. Broke, Bart., *H.M.S. 'Hero,' Sheerness; and Broke-hall, Suffolk.*
1870	*Midwinter, William Colpoys, Esq. *St. Michael's Rectory, Winchester; and Akyab, British Burmah.*
1868	*Miers, John William, Esq, C.E. 74, *Addison-road, Kensington, W.*
1859	Miland, John, Esq. *Clairville, Lansdown-road, Wimbledon.*
1866	Mildmay, Capt. Herbert St. John (Rifle Brigade). 19, *Charles-street, Berkeley-square, W.*
1860	Miles, Rev. R. *Bingham, Notts.*
1861	*Miller, Captain Henry Matthew, R.N. *The Grove, Exeter; and United Service Club, S.W.*
1868	Miller, Robert Montgomerie, Esq. *Culverden-grove, Tunbridge-wells.*
1853	1540*Miller, Capt. Thomas, R.N. *H.M.S. 'Royal George;' and U.S. Club, S.W.*
1861	Milligan, Joseph, Esq. 15, *Northumberland-street, W.C.*
1857	Mills, Arthur, Esq. 34, *Hyde-park-gardens, W.*
1863	*Mills, John R., Esq. *Kingswood-lodge, Tunbridge-wells.*
1864	Mills, Rev. John. 40, *Lonsdale-square, N.*
1860	Milman, Capt. Everard, Royal Horse Artillery. *Care of Mrs. Milman*, 9, *Berkeley-square, W.*
1866	Milne, Vice-Admiral Sir Alex., K.C.B. *United Service Club, S.W.*
1867	Milner, Rev. John, B.A. *Chaplain of H.M.S. 'Galatea.'*
1863	*Milton, Viscount, M.P. 17, *Grosvenor-street, W.*
1860	Mitchell, Captain Alexander. 6, *Great Stanhope-street, Park-lane, W.*
1862	1550*Mitchell, George, Esq. 22, *Bolton-street, Piccadilly, W.*
1864	Mitchell, Thomas, Esq., C.E. *Oldham.*
1859	Mitchell, Sir William. 6, *Hyde-park-gate, Kensington-gore, W.*
1851	*Mocatta, Frederick D., Esq. 9, *Connaught-place, W.*
1853	Moffatt, George, Esq. 103, *Eaton-square, S.W.*
1868	Moffitt, John, Esq. 5, *Canning-place, South Kensington, W.*
1861	Mollison, Alexander Fullerton, Esq. *Woodcote, Tunbridge-wells.*
1870	Moneta, Don Pompeio (Chief Engineer, Argent. Repub.). *Buenos Ayres.*
1871	Montagu, Jno. M. P., Esq. *Union Club, S.W.; and 51, St. George's-road, S.W.*
1842	*Montagu, Major Willoughby. *Clapham-common, S.*
1862	1560*Montague, Major Horace. 9, *Woburn-square, W.C.*

Year of Election.	
18 3	*Montefiore, Sir Moses, Bart., F.R.S., F.R.S.N.A. 7, *Grosvenor-gate, Park-lane, W.; and East-cliff-lodge, Ramsgate.*
1859	Montgomerie, Major T. G., Engrs., 1st Assist. Trig. Survey. *Care of Messrs. Alexander Fletcher & Co., 10, King's-arms-yard, Moorgate-street, E.C.*
1860	Montgomery, Robert Mortimer, Esq.
1865	Montgomery, Sir Robert, K.C.B. 7, *Cornwall-gardens, Queen's-gate, W.*
1839	Moody, General R. C., R.E. *Caynham-house, near Ludlow, Shropshire.*
1857	*Moor, Rev. Allen P., M.A., F.R.A.S. *Sub-Warden St. Augustine's College, Canterbury.*
1863	Moore, H. Byron, Esq. *Survey-office, Melbourne, Australia. Care of Mr. Wadeson, 100, St. Martin's-lane.*
1861	Moore, John Carrick, Esq., F.R.S. *Corswall, Wytonshire; Geological Society, W.C.; and 23, Bolton-street, W.*
1870	Moore, John, Esq. 36, *Mark-lane, E.C.*
1870	1570*Moore, Joseph, Esq. *Brockwell-house, Dulwich.*
1857	Moore, Major-General W. Y. *United Service Club, S.W.*
1870	Moran, Benjamin, Esq. 20, *Norfolk-terrace, Bayswater, W.; and 5, Westminster-chambers, Victoria-street, S.W.*
1863	More, R. Jasper, Esq. *Linley-hall, Salop.*
1869	*Morgan, Delmar, Esq. 17, *Bury-street, St. James's, S.W.*
1864	Morgan, D. L., Esq. *H.M.S. 'Euryalus.'*
1861	Morgan, Junius Spencer, Esq. 13, *Prince's-gate, Hyde-park, W.*
1861	Morgan, William, Esq., R.N. 1, *Sussex-place, Southsea, Hants.*
1866	Morland, Lieut. Henry, late I.N. *Assistant Dockmaster, &c., Bombay.*
1839	*Morris, Charles, Esq. *University Club, S.W.*
1871	1580Morris, Edwd. Ellis, Esq. *Bedfordshire Middle-class Public School, Bedford.*
1868	Morris, Eugene, Esq. *Birchwood, Sydenham, Kent.*
1871	*Morrison, Alf., Esq. 16, *Carlton-house-terrace, S.W.*
1863	Morrison, Colonel J. C. D. 40, *Albion-road, Finchley-road, N.W.*
1867	Morrison, Pearson, Esq. *Care of J. E. Dawson, Esq., 52, Moorgate-street, E.C.*
1865	Morson, Thomas, Esq. 124, *Southampton-row, Russell-square, W.C.*
1869	Moser, Robert James, Esq. 45, *Bedford-square, W.C.*
1869	Mott, F. T., Esq. 1, *De Montfort-street, Leicester.*
1861	*Mouat, Frederick J., Esq., M.D., Surgeon-Major and Inspector-General of Prisons, Bengal Army, &c. 12, *Durham-villas, Kensington, W.; and Athenæum Club, S.W.*
1868	*Mounsey, Aug. Henry, Esq. *British Legation, Florence.*
1871	1590*Mowatt, James, Esq., M.A. 74, *Upper Gloucester-place, W.*
1871	Moyle, Rev. Vyvyan Henry, M.A. *Normandy-house, Middlesborough.*
1871	*Mozley, H. W., Esq., M.A. *Eton College.*
1858	Mudie, Charles Edward, Esq. *Muswell-hill.*
1858	Mueller, Ferdinand, Esq., M.D., PH. DR. *Director of the Botanical Gardens, Melbourne. Care of Messrs. Dulau and Co., 37, Soho-square, W.*
1855	Muir, Thomas, Esq. 24, *York-terrace, Regent's-park, N.W.*
1867	*Muir, Thomas, jun., Esq. *Madeira; and 24, York-terrace, Regent's-park, N.W.*

Year of Election.	
1869	Müller, Albert, Esq. *Laton-cottage, South Norwood, S.*
1866	Mundella, A. J., Esq. *Nottingham.*
1869	Munton, Francis Kerridge, Esq. 21, *Montague-street, Russell-square, W.C.*
1866	1600*Murchison, John H., Esq. *Surbiton-hill, Kingston-on-Thames; and Junior Carlton Club, S. W.*
1859	Murchison, Kenneth R., Esq. 24, *Chapel-street, Park-lane, W; and Junior United Service Club.*
1864	Murchison, Captain R. M. *Bath and County Club, Queen-square, Bath.*
1830	*Murdock, Thomas W. C., Esq. 8, *Park-street, Westminster, S. W.; and River-bank, Putney, S. W.*
1860	Murray, George J., Esq. *Purbrook-house, Cosham, Hants; and Junior Carlton Club, S. W.*
1868	*Murray, Henry, Esq. *Hong-Kong. Care of Messrs. Jardine, Matheson, and Co., 3, Lombard-street, E.C.*
1844	*Murray, James, Esq.
1830	Murray, John, Esq. 50, *Albemarle-street, W.; and Newstead, Wimbledon, S. W.*
1860	*Murray, Lt. W., 68th Beng. N. Inf., Topo. Assist. G. Trig. Survey. *Mussoorie, India. Care of Messrs. H. S. King and Co.*
1870	Murray, T. Douglas, Esq. *Woolhope-court, near Ledbury, Hereford.*
1870	1610Murray, William Vaughan, Esq., M.R.I., &c. 4, *Westbourne-crescent, Hyde-park, W.*
1865	Mussy, H. G. de, Esq., M.D.
1865	Nairne, P. A., Esq. 2, *Grove-hill, Camberwell, S.*
1853	Napier, Major-General Geo. Thomas Conolly, C.B. *Junior United Service Club, S. W. Care of Sir J. Kirkland.*
1868	Napier, of Magdala, Lord, G.C.B., F.R.S.
1861	Napier, William, Esq. *Ardmore-lodge, Spring-grove.*
1870	Napier, Wm. Jno. Geo., Esq. (Master of Napier.) *Thatched-house Club, St. James's-street; and Thirlestone-castle, Selkirkshire.*
1871	Nares, Captain G. S., R.N. *Care of the Hydrographer, Admiral G. H. Richards.*
1870	Nash, Samuel, Esq., B.A., &c. 44, *Renshaw-street, Liverpool.*
1859	*Nasmyth, Capt. David J., 1st Assist. Trigonometrical Survey. 5, *Charlotte-street, Edinburgh.*
1857	1620*Nesbitt, Henry, Esq. 12, *Victoria-villas, Kilburn, N. W.*
1869	Neville, Lieut.-Col. Edward. 30, *Clarges-street, Piccadilly, W.*
1870	Newall, Wm. Johnstone, Esq. 33, *South-street, Park-lane, W.*
1868	Newbatt, Benjamin, Esq., F.S.S., &c. 7, *Vicarage-gardens, Campden-hill, W.*
1867	Newdigate, Lieut.-Col. Francis W. (Coldstream Guards). 26, *Seymour-street, W.; and Byrkley-lodge, Needwood Forest, Burton-upon-Trent.*
1856	Newman, Thomas Holdsworth, Esq. 9, *Gt. Cumberland-place, Hyde-park, W.*
1870	Nicholas, W., Esq. 31, *Lansdowne-road, Dalston, E.*
1870	1630Nicholl, Henry John, Esq. 16, *Hyde-park-gate, W.*
1870	Nichols, James, Esq. 22, *Lawrence Pountney-lane, E.C.; and "The Mount," Kenley, Surrey.*

Year of Election.	
1865	*Nichols, Robert C., Esq. 5, *Sussex-place, W.*
1856	Nicholson, Sir Charles, Bart., D.C.L., Chancellor of the University, Sydney. 26, *Devonshire-place, Portland-place, W.*
1868	Nicol, Geo. Wm., Esq. *Care of Messrs. Glyn, Mills, & Co., 67, Lombard-st. E.C.*
1866	Nicol, James D., Esq., M.P. 13, *Hyde-park-terrace, Cumberland-gate, W.*
1869	*Nicol, Robert, Esq. *Reform Club, S.W.; and Westminster-palace-hotel, S.W.*
1868	Nicol, Wm., Esq. 41, *Victoria-st., S.W.; and Fawsyde, Kenneff, Kincardine.*
1871	Nicols, Arthur Robert, Esq. *The Priory, Mill-hill, N.W.*
1836	Nicolson, Rear-Admiral Sir Frederick Wm. Erskine, Bart. 15, *William-street, Lowndes-square, S.W.*
1864	Nissen, H. A., Esq. *Mark-lane, E.C.*
1858	Nix, John H., Esq. 77, *Lombard-street, E.C.*
1861	Noel, The Hon. Roden. 11, *Chandos-street, Cavendish-square, W.; and Exton-hall, Oakham, Rutlandshire.*
1857	1640*Nolloth, Captain Matthew S., R.N. 13, *North-terrace, Camberwell, S.E.; and United Service Club, S.W.*
1865	Norman, H. J., Esq. 106, *Fenchurch-street, E.C.*
1860	Norris, Harry, Esq. *Colonial-office, S.W.; and 4, Little St. James's-street, S.W.*
1861	North, Alfred, Esq. 23, *Lansdowne-crescent, Notting-hill, W.*
1865	Northumberland, Algernon George, Duke of. *Northumberland-house, S.W.*
1862	Notman, Henry Wilkes, Esq. 7, *Great Marlborough-street, W.*
1862	Nourse, Henry, Esq. *Conservative Club, S.W.*
1858	*Oakeley, R. Banner, Esq.
1867	O'Brien, James, Esq. 109, *Belgrave-road, Pimlico, S.W.; and Clare, Ireland.*
1856	O'Connor, Major-General Luke Smyth, C.B. *United Service Club, S.W.*
1858	1650Ogilvie, Edward D., Esq. *Fulyillar, Clarence-river, New South Wales. Care of Messrs. Marryat and Sons, Laurence Pountney-lane, E.C.*
1863	Ogilvy, Col. Thos., 23, *Grafton-st., Piccadilly, W.; and Ruthven, Forfarshire, N.B.*
1861	Oldershaw, Capt. Robert Piggott. 74, *Warwick-square, Belgrave-road, S.W.*
1870	Oldham, Henry, Esq., M.D. 26, *Finsbury-square, E.C.*
1870	Oldham, Robert W., Esq. *Lloyd's, E.C.*
1855	Oliphant, Laurence, Esq. *Athenæum Club, S.W.*
1866	Oliver, Captain S. P., 12th Brigade R.A. 1, *Buckingham-villas, Brockhurst-road, Gosport, Hants.*
1845	*Ommanney, Admiral Erasmus, C.B., F.R.S., F.R.A.S. 6, *Talbot-square, Hyde-park, W.; and United Service Club, S.W.*
1838	*Ommanney, H. M., Esq. *Blackheath, S.E.*
1867	Ormathwaite, John Benn-Walsh, Lord. 28, *Berkeley-square, W.*
1853	1660Osborn, Sir George R., Bart. *Travellers' Club, S.W.; and Chicksand-priory, Beds.*
1856	Osborn, Capt. Sherard, C.B., F.R.S. 9, *Gloucester-terrace, W.; Athenæum and Reform Clubs, S.W.*
1870	Osborn, Commander Noel, R.N. *Junior United Service Club, S.W.*

Year of Election	
1861	*Osborne, Lieut.-Col. Willoughby. *Political Agent, Bhopal, Schira, India.*
1852	Oswell, William Cotton, Esq.
1860	*Ouvry-North, Rev. J. *East Acton, Middlesex, W.*
1870	*Overbeck, M. the Chev. G. de. *Hong-Kong. Care of Messrs. King and Co, 65, Cornhill, E.C.*
1844	*Overstone, Samuel, Lord, M.A., M.R.I. 2, *Carlton-gardens, S.W.; and Wickham-park, Surrey.*
1868	Owden, Thomas S., Esq. *Mount-pleasant, Philip-lane, Tottenham.*
1861	Page, Thomas, Esq., C.E., F.G.S. 5, *Adelphi-terrace, W.C.; and Tower Cressy, Aubrey-road, Bayswater, W.*
1853	1670Pakington, Right Hon. Sir John Somerset, Bart., M.P., F.R.S. 41, *Eaton-square, S.W.; and Westwood-park, Droitwich, Worcestershire.*
1868	Paliologus, William Thomas, Esq. *Care of Messrs. McGregor and Co., Charles-street, S.W.*
1870	Palmer, F. J., Esq., R.N. 4, *Furnival's-inn, W.C.*
1865	*Palmer, Captain George, R.N. *H.M.S. 'Rosario,' Australia; and Cavers, Hawick, Roxburghshire, N.B.*
1870	*Palmer, John Linton, Esq., Surg. R.N. 40, *Rock-park, Rockferry, Cheshire.*
1865	Palmer, Rev. Jordan, M.A., F.S.A., Chaplain to St. Ann's Royal Society, *Streatham, S.*
1838	*Palmer, Samuel, Esq.
1872	Palmer, Joseph, Esq., B.A., &c. *Wells, Somerset.*
1870	Pannel, Charles S., Esq. *Walton-lodge, Torquay.*
1865	*Papengouth, Oswald C., Esq., C.E. *Care of W. Hornibrook, Esq., 6, Regent's-square, W.C.*
1870	1680Parfitt, W. S., Esq., C.E. *Montevideo. Care of Mrs. Parfitt, Devizes, Wilts.*
1863	*Paris, H.R.H. le Comte de. *Claremont.*
1864	Parish, Captain A. *Bembridge, Isle of Wight.*
1849	*Parish, Capt. John E., R.N. *Army and Navy Club, S.W. Care of Messrs. Stilwell.*
1833	*Parish, Sir Woodbine, K.C.H., F.R.S., &c. *Quarry-house, St. Leonards-on-Sea.*
1866	Parker, Captain Francis G. S., 54th Regt., F.G.S., A.I.C.E. *Curragh, Ireland.*
1862	Parker, Robert Deane, Esq. *Barham, Canterbury.*
1850	Parkes, Sir Harry S., K.C.B., &c. *Oriental Club, W.; and Athenæum Club, S.W.*
1850	*Parkyns, Mansfield, Esq., F.Z.S. *Arthur's Club, St. James's-street, S.W.; and Woodborough-hall, Southwell.*
1859	Pasteur, Marc Henry, Esq. 38, *Mincing-lane, E.C.*
1867	1690Paterson, John, Esq. 19A, *Coleman-street, City, E.C.*
1857	Paton, Andrew A., Esq. *H.B.M.'s Vice-Consul, Missolonghi, Greece.*
1863	Pattinson, J., Esq. 21, *Bread-street, E.C.*
1868	Paul, J. H., Esq., M.D. *Camberwell-house, Camberwell, S.*
1858	Paul, Joseph, Esq. *Ormonde-house, Ryde, Isle of Wight.*
1872	Paxton, Robert Chas., Esq. 24, *Stafford-terrace, Phillimore-gardens, W.*
1865	Payne, Captain J. Bertrand, M.R.I., F.R.S.L., Mem. Geograph. Soc. of France. *Conservative Club, S.W.; Royal Thames Yacht Club, W.; and Tempsford-house, Grange-terrace, Brompton, W.*

Year of Election.	
1847	*Paynter, William, Esq., F.R.A.S. 21, *Belgrave-square, S.W.; and Camborne-house, Richmond, Surrey, S.W.*
1853	Peacock, George, Esq. *Starcross, near Exeter.*
1863	Pearse, Captain R. B., R.N. 9, *Hyde-park-street, W.*
1863	1700Pearson, Fred., Esq.
1853	*Peckover, Alexander, Esq. *Wisbeach.*
1860	*Peek, Henry William, Esq., M.P. *Care of G. Thorpe, Esq.*, 21, *Eastcheap, E.C.*
1858	Peel, Sir Robert, Bart., M.P. 4, *Whitehall-gardens, S.W.; and Drayton-manor, Tamworth.*
1868	*Pender, John, Esq. 18, *Arlington-street, W.*
1863	*Pennant, Colonel S. S. Douglas. *Penrhyn-castle, Bangor, N.B.*
1859	*Penrhyn, Lord. *Penrhyn-castle, Bangor.*
1853	Percy, Major-General the Hon. Lord Henry M. (Guards). 40, *Eaton-square, S.W.*
1865	Pereira, Francisco E., Esq. *Care of Messrs. Richardson, 13, Pall-mall.*
1860	Perkins, Frederick, Esq. *Mayor of Southampton.*
1865	1710Perkins, William, Esq. *Rosario, Argentine Republic. Care of the Central Argentine Railway Co., Palmerston-buildings, Old Broad-street.*
1859	Perry, Sir Erskine, Member Indian Council. 36, *Eaton-place, S.W.*
1865	Perry, Gerald R., Esq., British Consulate, Stockholm.
1859	Perry, William, Esq., H.B.M.'s Consul, Panama. *Athenæum Club, S.W.*
1862	*Perry, William, Esq. 9, *Warwick-road, Upper Clapton, N.E.*
1862	Peter, John, Esq. 12, *Stratton-street, Piccadilly, W.*
1857	*Peters, William, Esq. 35, *Nicholas-lane, Lombard-street, E.C.*
1860	*Petherick, John, Esq. *The Tookul, Withyham, near Tunbridge Wells.*
1861	Petrie, Alexander S., Esq. 4, *St. Mark's-square, N.W.*
1860	Petrie, Major Martin, 97th Regiment. *Hanover-lodge, Kensington-park, W.*
1871	1720Petter, G. Wm., Esq. *Streatham-grove, S.*
1866	Pharazyn, Robert, Esq. *Wellington, New Zealand. Care of Messrs. Seale and Rogers, 24, Mark-lane, E.C.*
1867	Phayre, Major-General Sir Arthur. *United Service Club, S.W.*
1854	Phelps, William, Esq. 18, *Montague-place, Russell-square, W.C.*
1862	*Phené, John Samuel, Esq., F.G.S. 5, *Carlton-terrace, Oakley-street, S.W.*
1860	Philip, George, Esq. 32, *Fleet-street, E.C.*
1865	Philipps, Edward B., Esq. 105, *Onslow-square, S.W.*
1857	Phillimore, Captain Augustus, R.N. 25, *Upper Berkeley-st., W.; and United Service Club, S.W.*
1859	Phillimore, Charles Bagot, Esq. *India-office, S.W.; and 25, Upper Berkeley-street, W.*
1860	Phillimore, Wm. Brough, Esq., late Capt. Grenadier Guards. 5, *John-street, Berkeley-square, W.*
1854	1730Phillips, Major-General Sir B. Travell. *United Service Club, S.W.*
1869	Phillips, Edward Augustus, Esq. *Chantry-lodge, 34, Alban-road, St. John's-wood, N.W.*
1871	Philpott, Edward P., Esq., M.D., LL.D. *Poole, Dorsetshire.*

Year of Election.	
1871	Pickersgill, Wm. Cunliffe, Esq. *Blindon-hall, Bexley, Kent.*
1867	Pierce, Charles A., Esq. 92, *Sloane-street, Chelsea.*
1871	Pierce, Josiah, Esq. 19, *Harley-street, W.*
1869	Piggot, John, jun., Esq., F.S.A., &c. *The Elms, Ulting, Maldon, Essex.*
1870	Pigott, Robt. Turtle, Esq. *Torrington-villas, Lee, Kent; and* 36, *Southampton-street, Strand, W.C.*
1864	*Pigou, F. A. P., Esq. *Dartford, Kent.*
1861	Pike, Frederick, Esq. *Co-operative Stores, Haymarket.*
1852	1740*Pike, Captain John W., R.N. *United Service Club, S.W.*
1855	Pilkington, James, Esq. *Blackburn.*
1865	Pilkington, William, Esq. *War-office.*
1852	*Pim, Captain Bedford C. T., R.N. *Belsize-square, Hampstead, N.W.; and Senior and Junior United Service Club, S.W.*
1870	Pimblett, James, Esq. *Tatenhill, Burton-on-Trent.*
1859	Pinney, Colonel William. 30, *Berkeley-square, W.*
1867	Plant, Nathaniel, Esq. *Hotel Exchange, Rio de Janeiro; and De Montfort-house, Leicester.*
1871	Platt, Lieut.-Colonel Chas. Rowley. 4, *Bolton-street, Piccadilly, W.*
1865	Player, John, Esq. 22, *Carpenter-road, Edgbaston, Birmingham.*
1860	Playfair, Lieut.-Col. Robert Lambert. H.B.M. Consul-General, Algiers. *Care of Messrs. H. S. King and Co.*, 45, *Pall-mall, S.W.*
1866	1750Plowden, Charles C., Esq. *Belgrave-mansions, Grosvenor-gardens, S.W.*
1856	*Plowes, John Henry, Esq. 39, *York-terrace, Regent's-park, N.W.*
1870	Plunkett, Major-Gen. the Hon. Charles Dawson. *United Service Club, S.W.*
1855	*Pollexfen, Captain J. J. *India.*
1866	*Pollington, John Horace, Viscount. 8, *John-street, Berkeley-square.*
1853	Pollock, Field-Marshal Sir George, Bart., G.C.B. *Clapham-common, Surrey, S.*
1835	*Ponsonby, The Hon. Frederick G. B. 3, *Mount-street, Grosvenor-square, W.*
1860	Pook, Captain John. 6, *Colfe's-villas, Lewisham-hill, S.E.*
1870	Poole, C. M., Esq., C.E. 8, *Cambridge-terrace, Notting-hill, W.*
1857	Pope, Captain Wm. Agnew. *Union Club, S.W.*
1863	1760*Porcher, Captain Edwin A., R.N. 3, *Montagu-square, W.*
1871	*Portal, Wm. Richd., Esq., M.A. *Tonge-house, Lower Norwood, S.*
1864	Portugal, Chevalier Joaquim de. 128, *Leadenhall-street, E.C.*
1868	Potter, Archibald Gilchrist, Esq. *Woodham-lodge, Lavender-hill, Wandsworth, S.W.*
1867	Potter, Wm. Henry, Esq. *Dunsden-lodge, Sowning, near Reading.*
1861	*Pounden, Captain Lonsdale. *Junior United Service Club, S.W.; and Brownswood, Co. Wexford.*
1862	Povah, Rev. John V., M.A. 11, *Endsleigh-street, W.C.*
1864	*Powell, F. S., Esq. 1, *Cambridge-square, Hyde-park, W.*
1859	Power, E. Rawdon, Esq. Retired List, Ceylon Civil Service. *Heywood-lodge, Tenby, South Wales; and Thatched-house Club, S.W.*

Year of Election.

1854 Power, John, Esq. 3, *College-terrace, Cambridge-road, Hammersmith, W.*
1868 1770Pownall, John Fish, Esq. 63, *Russell-square, W.C.*
1864 Powys, The Hon. C. J. F.
1864 Powys, The Hon. E. R.
1864 Powys, The Hon. Leopold. 17, *Montagu-street, Portman-square, W.*
1870 *Prance, Reginald H., Esq. *Frognal, Hampstead.*
1868 Price, Charles S., Esq. *Bryn Derwen, Neath.*
1869 Price, F. G. H., Esq. 1, *Fleet-street, E.C.*
1852 Price, James Glenie, Esq., Barrister-at-Law. 14, *Clement's-inn, W.C.*
1869 Prichard, Iltudus Thomas, Esq. 29, *Granville-park, Blackheath, S.E.*
1860 *Prickett, Rev. Thomas William, M.A., F.S.A. 11, *Lypiatt-terrace, Cheltenham.*
1868 1780Prideaux, Capt. W. F., Bombay Staff Corps. *Care of Messrs. King and Co., 45, Pall-mall, S.W.*
1865 *Pringle, A. Esq. *Yair, Selkirk, N.B.*
1855 *Pringle, Thomas Young, Esq. *Reform Club, S.W.*
1866 *Prinsep, Edw. Aug., Esq., B.C.S., Commissioner of Settlements in the Punjaub. *Umritsur. Care of Messrs. H. S. King and Co., 65, Cornhill, E.C.*
1868 Pritchard, Lieut.-Col. Gordon Douglas. *Bengal.*
1861 *Prodgers, Edwin, Esq. *The Rectory, Ayott St. Peter's, Herts.*
1852 Prout, John William, Esq., M.A., Barrister-at-Law. *Athenæum Club, S.W.; and Neasdon, Middlesex, N.W.*
1868 Pryce, James E. Coulthurst, Esq. *Conservator of the Port of Bombay.*
1862 *Puget, Lieut.-Colonel J., 8th Hussars. *Newbridge, Ireland.*
1872 Puleston, John H., Esq. 2, *Palace-gate, Kensington, W.*
1860 1790Puller, Arthur Giles, Esq. *Athenæum Club, S.W.; Arthur's Club, S.W.; and Youngsbury, Ware.*
1857 Purcell, Edward, Esq., LL.D. *Whitchurch, Monmouth.*
1869 Purdon, Lieut. George Frederic, R.N.
1865 *Pusey, Sidney E. Bouverie, Esq. 7, *Green-street, Grosvenor-square, W.*
1870 Pycroft, Sir Thomas, K.C.S.I. 10, *Kensington-gardens-terrace, Hyde-park, W.*

1861 Quin, Lord George. 15, *Belgrave-square, S.W.*
1862 Quin, John Thomas, Esq. *Care of Mr. Lambson, Epsom.*
1868 Quin, T. Francis, Esq. *Bathurst-house, 418, Clapham-road, Clapham, S.*

1871 Radcliffe, J. P., Esq. 14, *South-street, Thurloe-square; and Caverswall-castle, Cheadle, Staffordshire.*
1858 *Radstock, Graville Augustus, Lord. 30, *Bryanston-square, W.*
1869 1800Rae, Edward, Esq. *Claughton, near Birkenhead.*
1862 *Rae, James, Esq. 32, *Phillimore-gardens, Kensington, W.*

Year of Election.	
1853	Rae, John, Esq., M.D., LL.D. 2, *Addison-gardens-south, Holland-villas-road, Kensington, W.*
1870	Raikes, Francis Wm., Esq. *Junior Carlton Club.*
1867	Raleigh, Rev. A., D.D. *Arran-house, Highbury-new-park.*
1871	Ralli, Eustratius, Esq. 93, *Lancaster-gate, W.*
1871	Ralli, Pandeli, Esq. 17, *Belgrave-square, S.W.*
1870	Ralston, W. R. Shedden, Esq., M.A. *British Museum, W.C.*
1866	Ramsay, Alex., Esq. 45, *Norland-square, Notting-hill, W.*
1866	*Ramsay, Admiral G. *United Service Club, S.W.*
1867	1810Ramsay, John, Esq. *Islay, N.B.*
1851	*Ramsay, Rear-Admiral Wm., C.B., F.R.A.S. *Junior United Service Club, S.W.; and* 23, *Ainslie-place, Edinburgh.*
1867	*Ramsden, Richard, Esq., B.A. *Camp-hill, Nuneaton, Warwickshire.*
1869	Randell, Thomas, Esq. 1, *Redcliff-parade, Bristol.*
1868	Rankin, William, Esq. *Tiernaleague, Carndonagh, Donegal.*
1866	*Ransom, Edwin, Esq. *Kempstone, near Bedford.*
1869	Rassam, Hormuzd, Esq., Assistant Political Resident, Aden. *Ailsa-park-lodge, Twickenham, S.W.*
1859	Ratcliff, Colonel Charles, F.S A. *Athenæum Club, S.W.; Edgbaston, Birmingham; and Downing College, Cambridge.*
1870	Ratcliffe, Rev. Thomas, B.D., &c. 74, *Belgrave-road, Belgrave-square, S.W.*
1861	Rate, Lachlan Macintosh, Esq. 9, *South Audley-street, W.*
1846	1820Ravenshaw, E. C., Esq., M.R.A.S. *Oriental Club, W.; and* 36, *Eaton-sq.*, W.
1859	Ravenstein, Ernest G., Esq. *Alpha-cottage, Lorn-road, Brixton, S.W.*
1861	Rawlinson, Sir Christopher. *Everleigh-house, Marlborough, Wilts; Manydown-park, Basingstoke; and United University Club, S.W.*
1844	*Rawlinson, Major-General Sir Henry C., K.C.B., D.C.L., F.R.S. *Athenæum Club, S.W.; and* 21, *Charles-street, Berkeley-square, W.*
1838	Rawson, His Excellency Rawson Wm., C.B., Governor-in-Chief of the Windward Islands. *Barbadoes.*
1869	Ray, Captain Alfred William. *The Lodge, Brixton-oval, S.W.*
1869	Read, Lieut.-Col. William Fitzwilliam. *Junior United Service Club, S.W.*
1863	Reade, W. Winwood, Esq. 11, *St. Mary Abbott's-terrace, Kensington, W.; and Conservative Club.*
1865	Redhead, R. Milne, Esq. *Springfield, Seedley, Manchester; Conservative Club, S.W.; and Junior Carlton Club, S.W.*
1868	*Redman, John B., Esq., C.E. 6, *Westminster-chambers, Victoria-street, S.W.*
1871	1830Reed, Andrew Holmes, Esq. *Earlsmead, Upper Homerton, E.*
1858	Rees, L. E. R., Esq.
1859	Reeve, John, Esq. *Conservative Club, S.W.*
1866	*Rehden, George, Esq. 2, *Great Tower-street, E.C.*
1861	*Reid, David, Esq. 95, *Piccadilly, W.*
1856	Reid, Henry Stewart, Esq., Bengal Civil Service.
1857	Reid, Lestock R., Esq. *Athenæum Club, S.W.; and* 122, *Westbourne-ter., W.*

Year of Election.	
1871	*Reid, Robert, Esq., B.A., F.Z.S. *Iffley, Oxford.*
1861	Reilly, Anthony Adams, Esq. *Belmont, Mullingar.*
1869	*Reiss, James, Esq. 7, *Cromwell-road-houses, South Kensington, W.*
1830	1840*Rennie, Sir John, C.E., F.R.S., F.S.A. 7, *Lowndes-square, S.W.*
1866	*Rennie, John Keith, Esq., M.A. Camb. 56, *Gloucester-terrace, Hyde-park, W.*
1834	*Rennie, M. B., Esq., C.E. *Care of James Rennie, Esq.*, 9, *Motcomb-street, Belgrave-square, S.W.*
1864	Rennie, W., Esq. 14, *Hyde-park-square, W.*
1830	*Renwick, Lieutenant, R.E.
1861	Reuter, Julius, Esq. 1, *Royal Exchange-buildings, E.C.*
1858	Reynardson, Henry Birch, Esq. *Adwell, near Tetsworth, Oxfordshire.*
1867	Rhodes, Arthur John, Esq. 38, *Ordnance-road, St. John's-wood, N.W.*
1870	Rice, Joseph Marcus, Esq., M.D. 17, *Pleasant-street, Worcester City, Mass., U.S. Care of Messrs. Haseltine, Lake, and Co.*, 8, *Southampton-buildings, W.C.*
1870	Rice, Wm., Esq. 2, *Albert-villas, Evelyn-road, Richmond, S.W.; and Stanford's Geograph. Establishment, Charing-cross, S.W.*
1868	1850Richards, Alfred, Esq. *Tewkesbury-lodge, Forest-hill.*
1857	Richards, Admiral George H., F.R.S., C.B. *Admiralty, Whitehall, S.W.; and* 12, *Westbourne-terrace-road, W.*
1860	Richards, Rev. George, D.D. *Spring Mount, St. Leonard's-on-Sea.*
1864	Richardson, F., Esq. *Juniper-hall, Mickleham, Dorking.*
1859	Rickards, Edward Henry, Esq. 4, *Connaught-place, Hyde-park, W.*
1865	*Rideout, W. J., Esq. 51, *Charles-street, Berkeley-square, W.*
1864	Ridley, F. H., Esq. 11, *Mortimer-road, Kilburn, W.*
1864	Ridley, George, Esq. 2, *Charles-street, Berkeley-square, W.*
1862	*Rigby, Major-General Christopher Palmer. *Oriental Club, W.; and* 14, *Mansfield-street, W.*
1868	Riley, Captain Charles Henry. *Junior United Service Club, S.W.*
1860	1860Rintoul, Robert, Esq. *Windham Club, S.W.*
1853	Ripon, Geo. Fredk., Sam., Marquis of, F.R.S. 1, *Carlton-gardens, S.W.; and Studley Royal, Ripon.*
1868	*Roberts, Charles W., Esq. *Penrith-house, Effra-road, Brixton, S.W.*
1861	Roberts, Capt. E. Wynne. *Junior Carlton Club, S.W.; and* 18, *Great Cumberland-street, Hyde-park, W.*
1865	Robertson, A. Stuart, Esq., M.D. *Horwich, near Bolton.*
1860	Robertson, D. Brooke, Esq., H.B.M.'s Consul. *Canton. Care of Messrs. H. S. King and Co.*
1861	*Robertson, Graham Moore, Esq. 21, *Cleveland-square, Hyde-park, W.*
1870	*Robertson, James Nisbet, Esq. 23, *Porchester-square.*
1868	Robertson, Rev. J. S. S., M.A., F.R.A.S. *Duncrub-castle, Duncrub-park, Dunning, Perthshire, N.B.*
1863	Robertson, R. B., Esq. *H.M.'s Legation, Yokohama, Japan. Care of Capt. Brown, R.N.*, 10, *Portland-terrace, Southsea, Hants.*
1870	1870Robinson, Alfred, Esq. *Mountjoy-house, Huddersfield.*

Year of Election.	
1830	*Robinson, Rear-Admiral Charles G. 30, *Blomfield-ter., Upper Westbourne-ter., W.*
1872	Robinson, Henry, Esq., M.I.C.E., F.G.S. 7, *Westminster-chambers, S.W.*
1864	Robinson, H. O., Esq.
1859	Robinson, Sir Hercules G. R. *Governor of Ceylon. Messrs. Burnett, 17, Surrey-street, W.C.*
1871	Robinson, Rev. Henry Mowld, M.A. *Chigwell, Essex.*
1865	Robinson, J. R., Esq., LL.D., F.S.A. Scot., LL.D., F.R.S.A. du Nord, Copenhagen, F.G.S. Edin. Membre Société Asiatique de Paris, &c. *South-terrace, Dewsbury.*
1860	Robinson, Mr. Serjeant. 8, *King's-Bench-walk, Temple, E.C.; and* 43, *Mecklenburgh-square, W.C.*
1862	Robinson, Lieut.-Col. Sir John Stephen, Bart. *Arthur's Club, S.W.; and* 16A, *Park-lane, W.*
1864	Robinson, John, Esq. *Care of E. Street, Esq.*, 30, *Cornhill, E.C.*
1855	1880Robinson, Thomas F., Esq., F.L.S. 9, *Derwent-road, South Penge-park, Anerley, S.E.*
1850	*Robinson, Captain Walter F., R.N. 15, *Montpellier-villas, Brighton.*
1870	Robinson, Hon. W. C. F. (Governor of Prince Edward Island). *Care of the Colonial-office.*
1830	*Rodd, James Rennell, Esq. 29, *Beaufort-gardens, S.W.*
1860	Roe, Capt. Jno. Septimus, Surveyor-General, W. Australia. *Care of Mrs. Ellis Jervoise, 7, Euston-place, Leamington.*
1863	Rogers, John T., Esq. *River-hill, Sevenoaks.*
1872	Rolleston, W. Vilett, Esq. *Swindon, Wilts.*
1861	Rollo, Lord. *Dumcrieff-castle, Moffat, N.B.*
1863	Rönn, M. Hermann von. 21, *Kensington-park-gardens, W.*
1866	Rooke, Captain W., R.A. *Formosa, Lymington, Hants.*
1871	1890Rooks, Geo. Arthur, Esq. 24, *Lincoln's-inn-fields, W.C.*
1868	Roos, Gustaf, Esq.
1834	*Rose, The Right Hon. Sir George, F.R.S., LL.D. 4, *Hyde-park-gardens, W., and* 25, *Southampton-buildings, Chancery-lane, W.C.*
1868	Rose, Henry, Esq. 8, *Porchester-square, Hyde-park, N.W.*
1861	Rose, Jas. Anderson, Esq. *Wandsworth, Surrey, S.W.; and* 11, *Salisbury-street, W.C.*
1857	*Rose, Colonel Sir Wm. Anderson, Alderman, F.R.S.L. *Carlton Club, S.W.*; 63, *Upper Thames-street, E.C.; and Upper Tooting, S.W.*
1870	Rose, The Right. Hon. Sir John. 18, *Queen's-gate, Hyde-park, W.*
1864	Ross, B. R., Esq. *Care of the Hudson-bay Company, Hudson-bay-house,* 1, *Lime-street, E.C.*
1870	Ross, Capt. Geo. Ernest Augustus (King's Own Light Inf. Militia). *Bryn-Ellwn, Clapham-park, S.W.*
1867	Rossiter, Wm., Esq., F.R.A.S. *South London Working Men's College,* 91, *Blackfriars-road, S.E.*
1868	1900Ross-Johnson, H. C., Esq. 7, *Albemarle-street, W.*
1864	*Roundell, C. S., Esq. 44, *Piccadilly, W.*
1862	Roupell, Robert Priolo, Esq., M.A., Q.C. *J 5, Albany, W.*

Year of Election.	
1839	*Rous, Vice-Admiral the Hon. Henry John. 13, *Berkeley-square, W.*
1864	*Routh, E. J., Esq. *St. Peter's College, Cambridge.*
1862	Rowe, Sir Joshua, C.B., late Chief Justice of Jamaica. 10, *Queen Anne-street, Cavendish-square, W.*
1868	*Rowlands, Percy J., Esq. *India-office, S.W.*
1863	Rowley, Captain C., R.N. 33, *Cadogan-place, S.W.*
1856	Rucker, J. Anthony, Esq. *Blackheath, S.E.*
1861	*Rumbold, Charles James Augustus, Esq. *Downing College, Cambridge; and* 5, *Percival-terrace, Brighton.*
1861	1910Rumbold, Thomas Henry, Esq.
1860	Rumley, Major-General Randall, Vice-President Council of Military Education. 16, *Eaton-terrace, Eaton-square, S.W.*
1858	*Russell, Arthur John Edward, Esq., M.P. 10, *South Audley-street, W.*
1869	Russell, George, Esq., M.A. *Vicarfield, Southfields, Wandsworth; and* 16, *Old Change, St. Paul's, E.C.*
1830	*Russell, Jesse Watts, Esq., D.C.L., F.R.S.
1830	Russell, John, Earl, F.R.S. 37, *Chesham-place, S.W.; Pembroke-lodge, Richmond, S.W.; Endsleigh-ho., Devon; and Gart-ho., near Callander, N.B.*
1860	Russell, Wm. Howard, Esq., LL.D. *Carlton Club, S.W.; and* 18, *Sumner-place, Onslow-square, W.*
1860	Rutherford, John, Esq. 2, *Cavendish-place, Cavendish-square, W.*
1857	*Ryder, Admiral Alfred P. *U.S. Club, S.W.; and Launde-abbey, Uppingham.*
1864	Ryder, G., Esq. 10, *King's-Bench-walk, Temple, E.C.*
1869	1920Rylands, Peter, Esq., M.P. *Bewsey-house, Warrington.*
1868	Sabben, J. T., Esq., M.D., *Northumberland-house, Stoke Newington, N.*
1852	Sabine, Lieut.-General Sir Edw., K.C.B., R.A., Pres. R.S., F.R.A.S., &c. &c. 13, *Ashley-place, Victoria-street, Westminster, S.W.; and Woolwich, S.E.*
1869	St. Clair, Alexander Bower, Esq., H.B.M. Consul, Jassy, Moldavia.
1857	St. David's, Rt. Rev. Connop Thirlwall, Bp. of. *Abergwilly-palace, Carmarthen.*
1867	St. John, Lieut. Oliver Beauchamp Coventry, R.E. *National Club, S.W.*
1863	St. John, R. F. St. Andrew, Esq. *Pembroke-house, Red-hill.*
1862	St. John, Spenser, Esq., British Legation Chargé d'Affaires, Port-au-Prince, Haiti. *Care of J. A. St. John, Esq.,* 44, *St. John's-wood-ter., St. John's-wood, N.W.*
1863	Sale, Lieut. M. T., R.E.
1867	Salkeld, Colonel J. C. (H.M.I. Forces). 29, *St. James's-street, S.W.*
1868	1930Salles, J. de, Esq. 56, *Stanhope-gardens, South Kensington, W.*
1869	*Salmond, Robert, Esq. *Reform Club, S.W.;* 14, *Woodside-crescent, Glasgow; and Rankinston, Patna, Ayr.*
1845	*Salomons, Alderman Sir David, Bart., M.P., F.R.S., F.R.A.S. 26, *Great Cumberland-place, Hyde-park, W.; and Broom-hill, near Tunbridge-wells.*
1863	*Salt, Henry, Esq. 29, *Gordon-square, W.C.*
1861	Salting, William Severin, Esq. 6, *Grosvenor-gardens, S.W.*
1861	*Sandbach, Wm. Robertson, Esq. 10, *Prince's-gate, Hyde-park, S.W.*
1867	Sandeman, David George, Esq., *Cambridge-house, Piccadilly, W.*

Year of Election.	
1862	Sanford, Major Henry Ayshford. 29, *Chester-street, Grosvenor-place, S.W.; and Nynehead-court, Wellington, Somerset.*
1870	Sanford, W. Ayshford, Esq., F.R.S. 66, *Pall-mall; and Nynehead-court, Wellington, Somerset.*
1860	Sarel, Lieut.-Colonel H. A., 17th Lancers. *Army and Navy Club, S.W.; and Shanghae.*
1862	1940Sargood, F. J., Esq. *Moorgate-street-buildings, E.C.*
1869	Sarll, John, Esq. *Englefield-house, De Beauvoir-town, N.*
1860	Sartoris, Alfred, Esq. *Abbottswood, Stow-on-the-Wold.*
1852	Saumarez, Captain Thomas, R.N. *The Firs, Jersey.*
1866	Saunders, James Ebenezer, Esq., F.L.S., F.G.S., F.R.A.S. 9, *Finsbury-circus; and Granville-park, Blackheath, S.E.*
1864	Saurin, Admiral E. *Prince's-gate, S.W.*
1863	Sawyer, Col. Charles, 6th Dragoon Guards. 50, *Sussex-square, Kemp-town, Brighton.*
1871	Schalch, Ernest A. C., Esq. *Care of Miss Clendining*, 20, *Milton-street, Dorset-square, N.W.; and* 11, *King's-Bench-walk, E.C.*
1861	Schenley, Edward W. H., Esq. 14, *Prince's-gate, S.W.*
1870	Scobell, Sandford Geo. T., Esq. *Kingwell-hall, near Bath.*
1872	1950Scott, Abraham, Esq. 5, *Langford-place, St. John's-wood, N.W.*
1866	Scott, Adam, Esq. 8, *Warwick-road-west, Maida-vale, W.*
1866	Scott, Arthur, Esq. *Rotherfield-park, Alton, Hants; Travellers' Club, S.W.*
1859	Scott, Lord Henry. 3, *Tilney-street, Park-lane, W.*
1861	*Scott, Hercules, Esq. *Brotherton, near Montrose, N.B.*
1868	Scott, William Cumin, Esq. *Mayfield-house, Blackheath-park, S.E.*
1863	Scovell, George, Esq. 34, *Grosvenor-place, S.W.*
1861	Searight, James, Esq. 80, *Lancaster-gate, W.*
1867	Seaton, Colonel the Right Hon. Lord. *D* 3, *Albany, W.*
1830	*Sedgwick, Rev. A., Woodwardian Lecturer, M.A., F.R.S. *Athenæum Club, S.W.; and Cambridge.*
1869	1960Sedgwick, John Bell, Esq. 1, *St. Andrew's-place, Regent's-park, N.W.*
1866	Sendall, Walter T., Esq., Inspector of Schools in Ceylon. *Colombo.*
1865	Sercombe, Edwin, Esq. 49, *Brook-street, Grosvenor-square, W.*
1858	*Serocold, Charles P., Esq. *Brewery, Liquorpond-street, E.C.*
1853	Sevin, Charles, Esq. 155, *Fenchurch-street, E.C.*
1870	Sewell, Edward, Esq., M.A. *Ilkley, Yorkshire.*
1867	Seymour, Alfred, Esq., M.P. 47, *Eaton-square, S.W.*
1858	Seymour, George, Esq. 54, *Lime-street, E.C.*
1853	*Seymour, Henry Danby, Esq. *Athenæum Club, S.W.; Knoyle-house, Hindon, Wilts; and Glastonbury, Somersetshire.*
1854	*Shadwell, Admiral Charles F. A., C.B., F.R.S. *Meadow-bank, Melksham, Wilts.*
1860	1970*Shadwell, Lieut.-Colonel Lawrence. 9, *Queensberry-place, Cromwell-road, Kensington, W.*
1856	*Share, Staff Commander James Masters, R.N. *The Willows, Wyke Regis, Weymouth, Dorset.*

Year of Election.	
1866	Sharp, Henry T., Esq. 102, *Piccadilly, W.*
1861	Sharp, Peter, Esq. *Oakfield, Ealing, W.*
1861	*Sharpe, William John, Esq. 1, *Victoria-street, Westminster, S.W.; and Norwood, Surrey, S.E.*
1869	Shaw, James V., Esq. *The Elms, Twickenham, S.W.*
1862	*Shaw, John, Esq. *Finegand, Otago, New Zealand. Care of John Morrison, Esq., New Zealand Government Agency, 7, Westminster-chambers, Victoria-street, S.W.*
1861	Shaw, John Ralph, Esq. *Arrowe-park, Birkenhead.*
1870	*Shaw, Robert B., Esq. (British Trade Commissioner) *Ladak.*
1870	*Shearme, Edward, Esq. *Junior Athenæum Club, W.*
1846	1980Sheffield, George A. F. C., Earl of, F.R.S. 20, *Portland-place, W.; and Sheffield-park, Sussex.*
1868	*Shelley, Captain G. Ernest. 32, *Chesham-place, W.*
1867	Shenstone, Fredk. Smith, Esq. *Sutton-hall, Barcombe, Lewes.*
1861	Shephard, Chas. Douglas, Esq., Surgeon R.N. *Plantation House, near Cheadle, Staffordshire.*
1867	Shepherd, Chas. Wm., Esq., M.A., F.Z.S. *Trotterscliffe, Maidstone.*
1860	Sheridan, H. Brinsley, Esq. *Bellefield-house, Parson's-green, Fulham, S.W.*
1863	Sheridan, Richard B., Esq., M.P. *Oaklands, St. Peter's, Thanet.*
1857	Sherrin, Joseph Samuel, Esq., LL.D., PH. DR. *Leyton-house, Leyton-crescent. Kentish-town, N.W.*
1859	*Sherwill, Lieut.-Col. W. S., F.G.S. *Perth, N.B.*
1858	*Shipley, Conway M., Esq. *Twyford Moors, Winchester; and Army and Navy Club, S.W.*
1868	1990Shirley, Lionel H., Esq., C.E., &c. *Raleigh Club; and The Lypiatts, Cheltenham.*
1871	*Shoolbred, James, Esq. 38, *Lancaster-gate, Hyde-park, W.*
1864	Short, Rev. Thos. Vowler.
1856	Shuttleworth, Sir J. P. Kay, Bart. 3, *Victoria-street, S.W.; and Gawthorp-hall, Burnley, Lancashire.*
1869	Silk, George Chas., Esq. *The Vicarage, Kensington, W.*
1871	*Sills, Wm. Bernard, Esq. 19, *Beaufort-gardens, S.W.*
1870	Silva, Emanuel, Esq. 8, *Sheen Villas, Park-road, Richmond, S.W.*
1865	*Silva, Frederic, Esq. 12, *Cleveland-square, Bayswater, W.*
1859	Silver, the Rev. Fred., M.A., F.R.A.S. *Norton-rectory, Market Drayton, Salop.*
1859	*Silver, Stephen Wm., Esq. 66, *Cornhill, E.C.; and Norwood-lodge, Lower Norwood, S.E.*
1860	2000Sim, John Coysgame, Esq. 13, *James-street, Buckingham-gate, S.W.*
1853	Simmons, Edward R., Esq., Barrister-at-Law. *Nevill-house, Belgrave-terrace, Brighton.*
1848	*Simmons, Major-General Sir John L. A., R.E., K.C.B. *Lieut.-Governor Royal Military Academy, Woolwich, S.E.*
1866	Simons, Henry M., Esq. *Tyersall-crescent, Wood-road, Sydenham-hill, S.E.*
1864	Simpson, Frank, Esq. 17, *Whitehall-place, S.W.*

Year of Election.	
1862	Simpson, Henry Bridgeman, Esq. 44, *Upper Grosvenor-street, W.*
1863	*Simpson, William, Esq. 64, *Lincoln's-inn-fields, W.C.*
1866	*Sims, Richard Proctor, Esq., C.E. *Malabar-hill, Bombay. Care of Messrs. H. S. King and Co.*
1858	Skelmersdale, Edward, Lord. *Lathom-park, Ormskirk, Lancashire.*
1866	Skinner, John E. H., Esq. 3, *Dr. Johnson's-buildings, Temple, E.C.*
1863	2010Skrine, Henry D., Esq. *Warleigh-manor, near Bath.*
1870	Sladen, Major E. B. (Polit. Agent at the Court of H.M. the King of Burmah). *Oriental Club, W.; and* 126, *New Bond-street, W.*
1861	Sladen, Rev. Edward Henry Mainwaring. *Alton, near Marlborough, Wilts.*
1861	Sligo, G. J. Browne, Marquis of. 14, *Mansfield-street, W.; and Westport, County Mayo.*
1865	Smedley, Joseph V., Esq., M.A. *Oxford and Cambridge Club, S.W.*
1871	Smetham, John Osborne, Esq. *King's Lynn, Norfolk.*
1860	*Smith, Augustus Henry, Esq. *Flexford-house, Guildford.*
1857	*Smith-Bosanquet, Horace, Esq. *Broxbourne-bury, Hoddesdon.*
1866	Smith, Drummond Spencer-, Esq. 7, *Mount-street, Berkeley-square, W.*
1859	Smith, Edward, Esq. *Windham Club, S.W.*
1865	2020Smith, Guildford, Esq. 63, *Charing-cross, S.W.*
1871	Smith, Geo. Fereday, Esq., M.A., J.P., &c. *Parkfield, Swinton, Manchester.*
1861	Smith, Jervoise, Esq. 47, *Belgrave-square, S.W*
1853	Smith, John Harrison, Esq. 55, *Chepstow-place, Bayswater, W.*
1853	Smith, John Henry, Esq. 1, *Lombard-st., E.C.; and Purley, Croydon, Surrey.*
1861	*Smith, Joseph Travers, Esq. 25, *Throgmorton-street, E.C.*
1868	*Smith, Major Robert M., R.E., Director of the Telegraphic Establishment in Persia, Teheran.
1857	Smith, Captain Philip, Grenadier Guards.
1841	*Smith, Thomas, Esq.
1859	*Smith, W. Castle, Esq. 1, *Gloucester-terrace, Regent's-park, N.W.*
1857	2030Smith, Wm. Gregory, Esq. *Hudson-bay Company,* 1, *Lime-street, E.C.*
1859	Smith, William Henry, Esq., M.P. 1, *Hyde-park-street, W.*
1869	Smyth, Colonel Edmund. *Elkington-hall, Wetton-hill, Lincolnshire.*
1869	*Smyth, Warington, Esq., F.R.S. 92, *Inverness-terrace, W.*
1837	*Smyth, Rear-Admiral William. *Care of Messrs. Child and Co., Temple-bar.*
1850	*Smythe, Colonel William J., R.A., F.R.S.
1865	*Solomons, Hon. George. *Jamaica.*
1839	*Somers, Charles, Earl. 33, *Prince's-gate, S.W.; Eastnor-castle, Herefordshire; and The Priory, Reigate, Surrey.*
1862	Somerset, Capt. Leveson E. H., R.N. *Care of Messrs. Chard,* 3, *Clifford's-inn, Fleet-street, E.C.*
1855	Sopwith, Thos., Esq., M.A., C.E., F.R.S. 103, *Victoria-street, Westminster, S.W.*
1860	2040*Southey, James Lowther, Esq. *Care of Messrs. Stilwell.*
1860	Southesk, The Right Hon. James Carnegie, Earl of. 38, *Portland-place, W.*
1869	Southwell, Thomas Arthur Joseph, Viscount. *Windham Club, S.W.*

Year of Election.	
1865	Spalding, Samuel, Esq. 7, *Upper Park-road, South Hampstead, N.W.*
1870	Sparks, J. Hyde, Esq. *Conservative Club, S.W.*
1870	Spencer, Admiral the Hon. J. W. S. 5, *Portman-street, W.*
1867	Spicer, Edward, Esq. *Woodside, Muswell-hill, N.*
1863	Spickernell, Dr. Geo. E., Principal of Eastman's Royal Naval Establishment. *Eastern-parade, Southsea.*
1855	*Spottiswoode, William, Esq., F.R.S. 50, *Grosvenor-place, S.W.*
1859	*Spratt, Capt. Thos. A. B., R.N., C.B., F.R.S. *Clare-lodge, Nevill-park, Tunbridge-wells, Kent.*
1866	2050Spruce, Richard, Esq., PH. DR. *Welburn, Castle Howard, York.*
1871	Square, William, Esq., F.R.C.S. 22, *Portland-square, Plymouth.*
1859	Stafford, Edward W., Esq. *Colonial Secretary of New Zealand. Care of Mr. J. S. Tytler,* 19, *Castle-street, Edinburgh.*
1868	Staley, of Honolulu, The Right Rev. Bishop, D.D. 5, *Park-place, St. James's, S.W.*
1853	Stanford, Edward, Esq. 6, *Charing-cross, S.W.*
1855	Stanhope, Philip Henry, Earl, Pres. Soc. of Antiquaries, F.R.S. 3, *Grosvenor-place-houses, Grosvenor-place, S.W.; and Chevening, Sevenoaks, Kent.*
1860	*Stanhope, Walter Spencer, Esq. *Cannon-hall, Barnsley, Yorkshire.*
1856	Stanley, Edmund Hill, Esq. *Leicester-house, Gipsy-hill, Norwood, S.E.*
1870	Stanley, Lieut. Henry, R.N. *Admiralty Survey, Melbourne. Care of Captain J. E. Davis,* R.N.
1869	Stanton, Charles Holbrow, Esq. 1, *Mitre-court-buildings, Inner Temple, E.C.*
1863	2060Stanton, George, Esq. *Coton-hill, Shrewsbury; and Conservative Club, S.W.*
1867	Stanton, Henry, Esq. 1, *River-street, Myddelton-square, W.C.*
1871	Stark, Wm. Emery, Esq. *Chancellor-villa, Park-road, West Dulwich, S.E.*
1870	Starling, Joseph, Esq. *Chichester-lodge, Dyke-road, Brighton.*
1856	Statham, John Lee, Esq. 60, *Wimpole-street, W.*
1863	*Staveley, Miles, Esq. *Old Sleningford-hall, Ripon.*
1868	Staveley, Major-Gen. Sir Charles, K.C.B. *Government-house, Devonport; and United Service Club, S.W.*
1869	Stebbing, Edward Charles, Esq. *National Debt Office,* 19, *Old Jewry, E.C. and The Aspens, Sunbury.*
1867	Steel, J. P., Esq., Lieut. R.E. *Junior United Service Club, S.W. Care of Messrs Grindlay and Co.,* 55, *Parliament-street, S.W.*
1868	Steel, William Strang, Esq. 13, *Leadenhall-street, E.C.*
1871	2070Stein, Hon. Robert. *Port Louis, Mauritius. Care of Robt. McKerrell, Esq.,* 45, *Inverness-terrace, W.*
1870	Stenning, Charles, Esq. 3, *Upper Hamilton-terrace, N.W.*
1850	*Stephen, Sir George. *Melbourne. Care of Mr. H. W. Ravenscroft,* 7, *Gray's-inn-square, W.C.*
1870	*Stephens, Thomas Wall, Esq. *North-villa, Regent's-park, N.W.*
1869	Stephenson, B. Charles, Esq. 12, *Bolton-row, Mayfair, W.*
1857	Stephenson, Sir R. Macdonald, C.E. 10, *Inverness-terrace, Kensington-gardens, W.; and East-cottage, Worthing.*
1868	Stephenson, Henry P., Esq. 8, *St. Mary-axe, E.C.*

Year of Election	
1866	Stepney, A. K. Cowell, Esq. 6, *St. George's-terrace, Knightsbridge, S.W.*
1862	Sterry, Henry, Esq. *Eastbury, Leigham-court-road, Streatham.*
1869	Steuart, Colonel T. R., Bombay Army. *Esjair, Machynlleth, Wales.*
1855	Stevens, Henry, Esq., F.S.A. 4, *Trafalgar-square, W.C.*
1841	208oStevenson, Thomas, Esq., F.S.A. 37, *Upper Grosvenor-street, W.*
1869	Stewart, Capt. C. E., I.A. (Bengal Staff Corps). 14, *Sussex-gdns., Hyde-park, W.*
1871	Stewart, Captain Herbert, 37th Regiment. *Care of Rev. E. Stewart, Sparshot, near Winchester.*
1866	Stewart, Rev. Dr. James. *Lovedale, Alice, South Africa. Care of Robert Young, Esq., Offices of the Free Church of Scotland, Edinburgh.*
1860	*Stewart, Major J. H. M. Shaw, Royal Madras Engineers.
1869	Stewart, J. L., Esq., M.D., Forest Department, India. *Kew, S.W.*
1870	Stilwell, Henry, Esq., M.D. *Moorcroft, Hillington, Uxbridge.*
1868	Stirling, The Hon. Edward. 34, *Queen's-gardens, Hyde-park, W.*
1860	Stirling, Capt. Frederick H., R.N. *H.M.S. 'Hero;' and United Service Club, S.W.*
1863	Stirling, Sir Walter, Bart. 36, *Portman-square, W.*
1868	209oStock, Thomas Osborne, Esq., M.P. 51, *Portsdown-road, W.*
1860	Stocker, John Palmer, Esq. 93, *Oxford-terrace, Hyde-park, W.*
1845	*Stokes, Rear-Admiral John Lort. *United Service Club, S.W.; and Scotchwell, Haverfordwest, Wales.*
1868	Stone, David H., Esq., Alderman. *Sydenham-hill, S.E.*
1867	*Story, Edwin, Esq., M.A. 3, *King Edward's-terrace, Liverpool-road, Islington, N.*
1870	Stoton, William O., Esq. *Junior Carlton Club, S.W.*
1868	Stovin, Rev. Charles F. 8, *Grosvenor-mansions, Victoria-street, S.W.*
1866	Strachey, Colonel Richard, R.E., F.R.S. *India-office, S.W.*
1861	Strange, Lieut.-Col. Alexander, F.R.S. *India Store Department, Belvedere-road, Lambeth, S.E.*
1858	Stratford de Redcliffe, Stratford Canning, Viscount. 29, *Grosvenor-square, W.*
1864	210cStraton, Rev. N. D. J. *Kirkby-wharf, Tadcaster.*
1860	Strickland, Edward, Esq., C.B., Commissary-General. *Halifax, Nova Scotia.*
1868	*Strode, Alf. Rowland Chetham, Esq. *Dunedin, Otago, New Zealand. Care of J. G. Cooke, Esq.*
1865	Strong, F. K., Esq., K.H. *Hamburg, Germany.*
1853	Strousberg, Dr. Bethel Henry. 70, *Wilhelm-strasse, Berlin. Care of Messrs. Asher and Co., Bedford-street, Covent-garden, W.C.*
1853	Strutt, George H., Esq., F.R.A.S. *Bridge-hill, Belper.*
1858	Strutt, Captain Hammel Ingold, F.R.A.S. *Royal Mail Steam Packet Company, Southampton.*
1853	*Strzelecki, Count P. E. de, C.B., F.R.S. 23, *Savile-row, W.*
1859	Stuart, Lieut.-Col. J. F. D. Crichton. 25, *Wilton-crescent, Belgrave-sq., S.W.*
1861	Stuart, Vice-Chancellor Sir John. 11 *and* 12, *Old-buildings, Lincoln's-inn, W.C.*; 5, *Queen's-gate, Hyde-park, W.; and Grushernish, Isle of Skye, Inverness-shire.*
1866	211oStuart, Major Robert. *Janina, Albania.*
1872	Styan, Arthur, Esq., F.S.A. 28, *Norfolk-crescent, Hyde-park, W.*

Year of Election.	
1858	Sudeley, Charles G. Hanbury Tracy, Lord. 5, *Bolton-row, W.; and Toddington, near Broadway, Worcester.*
1857	Sulivan, Rear-Admiral Sir Bartholomew J., R.N., K.C.B.
1865	Sullivan, Captain T. W., C.B., R.N. *Kimpton, Welwyn, Herts.*
1869	Summerhayes, William, Esq., M.D. *Upper St. Giles's, Norwich.*
1862	Surridge, Rev. Henry Arthur Dillon, M.A. 21, *Berners-street, W.*
1862	Surtees, Colonel Charles Fieville. *Chalcott-house, Long Ditton, Surrey.*
1861	*Sutherland, George Granville William, Duke of, F.R.S. *Stafford-house, St. James's-palace, S.W.*
1869	Sutherland, Robert, Esq. *Egham-rise, Surrey.*
1869	2120Sutherland, Thomas, Esq. *H* 3, *Albany, Piccadilly, W.*
1871	Sutton, W. P., Esq., LL.D., F.S.A., &c. *Freathy-college, Millbrook, near Devonport.*
1871	Swan, Major Percival. 114, *Piccadilly, W.*
1857	Swanzy, Andrew, Esq. *Sevenoaks, Kent.*
1836	*Swinburne, Rear-Admiral Charles H. *Holmewood, Henley-on-Thames.*
1862	*Swinburne, Commr. Sir John, Bart., R.N. 9, *Queen-square, Westminster, S.W.; and Capheaton, Newcastle-on-Tyne.*
1863	Swinhoe, R., Esq., H.B.M. Consul, Taiwan. *Care of Mr. Charles Arkell, 11, Cross-lane, St. Mary-at-hill, E.C.*
1851	Sykes, Colonel William Henry, M.P., F.R.S., Hon. M.R.I.A. *Athenæum Club, S.W.; and 47, Albion-street, Hyde-park, W.*
1871	Syme, Henry, Esq. 35, *Weymouth-street, Portland-place, W.*
1864	Symonds, F., Esq., M.D. *Beaumont-street, Oxford.*
1852	2130*Synge, Colonel Millington H., R.E. *Abercliff, Alverstoke, Hants.*
1852	Tagart, Courtenay, Esq. *Rockleaze Point, Durdham Down, near Bristol.*
1859	Tagart, Francis, Esq. 31, *Craven-hill-gardens, Hyde-park, W.*
1866	Taintor, Edward C., Esq. (Imperial Chinese Customs). *China. Care of H. C. Batchelor, Esq.*, 155, *Cannon-street, E.C.*
1864	Tait, P. M., Esq. 38, *Belsize-park, N.W.; and Oriental Club, W.*
1857	*Tait, Robert, Esq. 14, *Queen Anne-street, W.*
1867	Talbot, Right Hon. Richard Gilbert. *Ballinclea, Kingstown, County Dublin.*
1861	Talbot de Malahide, James Talbot, Lord, F.R.S. *Malahide Castle, Co. Dublin.*
1861	Taylor, Commander A. Dundas, R.N. 6, *Lawn-terrace, Blackheath, S.E.*
1869	Taylor, George N., Esq. *Woodside, Windsor-forest, Berks.*
1865	2140Taylor, H. L., Esq. *Reform Club, S.W.; and* 23, *Phillimore-gardens, Kensington, W.*
1865	Taylor, Rev. Jas. Hudson. *Ningpo, China. Care of Mr. Berger, Saint-hill, East Grinstead.*
1863	Taylor, John, Esq. *Grena-lodge, Richmond.*
1870	*Taylor, John Fenton, Esq. 20, *New-street, Spring-gardens, S.W.*
1867	*Taylor, John George, Esq. *H.B.M. Consul in Kurdistan, Diarbekir. Care of Messrs. O'Brien and Co.*, 43, *Parliament-street, S.W.*

Year of Election.	
1854	*Taylor, John Stopford, Esq., M.D. 1, *Springfield, St. Anne-street, Liverpool.*
1871	*Taylor, John, Esq. *The Rocks, Bath; and Booth-hall, Blackley, Lancashire.*
1863	Taylor, Colonel R. C. H. 16, *Eaton-place, S.W.; and Carlton Club, S.W.*
1864	Taylor, W. R., Esq.
1857	Teesdale, John M., Esq. *Eltham-house, Eltham, S.E.*
1863	2150Tegg, William, Esq. 13, *Doughty-street, Mecklenburgh-square, W.C.*
1865	Temple, Sir Richard, R.C.S.I.
1860	Templeton, John, Esq. 24, *Budge-row, E.C.*
1857	Tennant, Professor James. 149, *Strand, W.C.*
1872	Terrero, Maximo, Esq. (Consul-General for Republic of Paraguay.) 88, *Belsize-park-gardens, N.W.*
1870	Teschemacher, Edward Fred., Esq. 1, *Highbury-park-north, N.*
1830	*Thatcher, Colonel E.I.C.
1863	Thomas, G., Esq. 31, *Queen's-gate-terrace, Hyde-park, W.*
1854	Thomas, Henry Harrington, Esq. 8, *Camden-crescent, Bath.*
1864	Thomas, J. R., Esq., Staff Assist. Surg. *Castle-hill, Fishguard, Pembrokeshire.*
1865	2160Thomas, John Henwood, Esq. *East India Dept., Custom-house, E.C.*
1869	Thompson, Lieut.-Col. George, C.E., Cordoba, Argentine Confederation. *Care of Messrs. Parlane, Graham, and Co., Buenos Ayres; Messrs. Lumb, Wanklyn, and Co., 10, Angel-court, Throgmorton-street, E.C.*
1869	*Thompson, Henry Yates, Esq. *Vice-regal Lodge, Dublin; 2, Cleveland-row, St. James's, S.W.; and Thingwall-park, near Liverpool.*
1854	Thompson, William C., Esq.
1863	Thomson, James, Esq. *Dunstable-house, Richmond.*
1863	Thomson, James Duncan, Esq., Portuguese Consul. *St. Peter's-chambers, Cornhill, E.C.*
1848	*Thomson, J. Turnbull, Esq., Chief Surveyor. *Otago, New Zealand.*
1866	Thomson, John, Esq. *Care of John Little, Esq., 21, Cannon-street, E.C.*
1861	*Thomson, Ronald Ferguson, Esq., 1st Attaché to the Persian Mission.
1854	*Thomson, Thomas, Esq., M.D., F.R.S. *Hope-house, Kew, W.*
1865	2170Thomson, W. T., Esq.
1862	*Thorne, Augustus, Esq. 4, *Cullum-street, City, E.C.*
1867	Thornton, Edward, Esq., C.B. *Harrow.*
1847	Thornton, Rev. Thomas Cooke, M.A., M.R.I. *Brock-hall, near Weedon, Northamptonshire.*
1858	Thorold, Rev. A. W. 31, *Gordon-square, W.C.*
1868	Thorold, Alexander W. T. Grant, Esq. *Medsley, Great Grimsby, Lincolnshire.*
1871	Thorpe, Wm. Geo., Esq., F.G.S. *Gloucester-house, Larkhall-rise, S.W.; and Barton's-house, Ipplepen, Newton Abbot, Devon.*
1861	Thrupp, John, Esq.
1859	Thuillier, Lieut.-Colonel H. L., Surveyor-General of India, F.R.S. *Calcutta; Messrs. Grindlay and Co. Care of J. Walker, Esq., India Office.*
1865	*Thurburn, C. A., Esq. 16, *Kensington-park-gardens, Notting-hill, W.*
1864	2180*Thurburn, Hugh, Esq. 108, *Westbourne-terrace, W.*

Year of Election.	
1861	Thurlow, The Hon. Thos. J. Hovell. *Dumphail, Torres, N.B.*
1868	Tilley, Henry Arthur, Esq. *Hanwell, Middlesex, W.*
1872	Tinline, George, Esq. 17, *Prince's-square, Bayswater, W.*
1839	*Tinne, John A., Esq. *Briarley, Aigburth, near Liverpool.*
1862	Todd, John, Esq. *Eastcote-lodge, St. John's-park, Blackheath, S.E.*
1865	Todd, Rev. John W. *Tudor-hall, Forest-hill, Sydenham, S.*
1853	*Tomlin, George Taddy, Esq., F.S.A. *Combe-house, Bartonfields, Canterbury.*
1853	Tomline, George, Esq. 1, *Carlton-house-terrace, S.W.*
1856	Torrance, John, Esq. 5, *Chester-place, Hyde-park-square, W.*
1866	2190Torrens, Robert Richard, Esq., M.P. 2, *Gloucester-place, Hyde-park, W.; and The Cott, Holm, near Ashburton, South Devon.*
1859	Townsend, Commander John, R.N. *Lona, Weston-super-Mare.*
1866	Townson, Wm. Parker, Esq., B.A. Cantab. *Care of Miss Townson, Ash-house, Caton, near Lancaster.*
1846	*Towry, George Edward, Esq.
1858	Towson, J. Thomas, Esq. *Secretary Local Marine Board, Liverpool.*
1864	*Toynbee, Capt. Henry. 25, *Inverness-road, Kensington-gardens, W.*
1863	*Tozer, Rev. H. F., M.A. *Exeter College, Oxford.*
1864	Tracy, The Hon. C. H. 11, *George's-street, W.*
1863	*Travers, Arch., Esq. *Addison-road (opposite the Napier-road), Kensington, W.*
1867	Tremenheere, Major-General C.W., R.E. *Bombay.*
1859	2200Tremlett, Rev. Francis W., M.A., D.C.L., DR. PH. *Belsize-park, Hampstead, N.W.*
1869	Trench, Captain Frederic. *Naval and Military Club, Piccadilly, W.*
1865	*Trench, Major the Hon. Le Poer, R.E. 32, *Hyde-park-gardens, W.; and Ordnance-survey-office, Pimlico, S.W.*
1863	Trestrail, Rev. Frederick. *St. John's-road, Newport, Isle of Wight.*
1862	Trevelyan, Sir Charles Edward, K.C.B. 8, *Grosvenor-crescent, S.W.*
1830	Trevelyan, Sir Walter Calverly, Bart., M.A., F.S.A., F.L.S., F.R.S.N.A., &c. *Athenæum Club, S.W.; Wallington, Northumberland; and Nettlecombe, Somerset.*
1864	Trimmer, Edmund, Esq. *Care of Messrs. Trimmer and Co., New City-chambers, Bishopsgate-street, E.C.*
1867	Tritton, Joseph Herbert, Esq. 54, *Lombard-street, E.C.*
1871	Trivett, Captain John Fredk., R.N.R. 3, *Campbell-terrace, Bow, E.*
1869	Trotter, Lieut. Henry, R.E. 11, *Hertford-street, Mayfair, W.*
1872	2210Trotter, Lieut. J. Moubray. *Naval and Military Club, Piccadilly, W.*
1870	Trutch, J. W., Esq. (Chief Commissioner of Lands and Works). *British Columbia.*
1867	Tryon, Captain George, R.N., C.B. *Army and Navy Club, S.W.*
1862	Tuckett, Francis Fox, Esq. *Frenchay, near Bristol.*
1835	*Tuckett, Frederick, Esq. 4, *Mortimer-street, Cavendish-square, W.*
1865	Tuckett, Philip D., Esq. 28, *Cleveland-gardens, Hyde-park, W.*
1852	Tudor, Edward Owen, Esq., F.S.A. 80 *Portland-place, W.*
1857	Tudor, Henry, Esq. 80, *Portland-place, W.*

Year of Election.	
1870	Tupper, Lieut.-Col. D. W. *Army and Navy Club, S.W.*
1864	Turnbull, George, Esq., C.E., F.R.A.S. 23, *Cornwall-gardens, South Kensington, W.*
1834	2220*Turnbull, Rev. Thomas Smith, F.R.S. *University Club, S.W.; and Blofield, Norfolk.*
1870	Turner, Major-General Henry Blois, Bomb. Eng. 131, *Hurley-street, W.*
1863	Turner, Thomas, Esq. *Guy's-hospital, Southwark, S.E.*
1867	Tweedie, Captain Michael, R.A. *Care of R. W. Tweedie, Esq., 5, Lincoln's-inn-fields.*
1864	*Twentyman, A. C., Esq. *Tettenhall-wood, near Wolverhampton.*
1863	Twentyman, William H., Esq. *Ravensworth, St. John's-wood-park, N.W.*
1863	*Twiselton, Hon. E. F. *Rutland-gate, S.W.*
1849	Twiss, Sir Travers, D.C.L., F.R.S. 19, *Park-lane, W.*
1858	Twyford, Captain A. W., 21st Hussars. *Resident Commissioner, H. M.'s Convict Prisons, British Guiana. Care of A. J. Murray, Esq., 7, Whitehall-place, S.W.; and Reform Club, S.W.*
1865	Tyer, Edward, Esq., C.E., F.R.A.S. 15, *Old-jewry-chambers, E.C.*
1862	2230*Tyler, George, Esq. 24, *Holloway-place, Holloway-road, N.*
1859	Tytler, Captain W. Fraser. *Aldowrie, Inverness.*
1869	Underdown, E. M. Esq., 3, *King's-Bench-walk, Temple, E.C.*
1862	Underhill, Edward Bean, Esq., LL.D. *Derwent-lodge, Thurlow-road, Hampstead, N.W.*
1868	Unwin, Howard, Esq., C.E. 24, *Bucklersbury, E.C.*
1861	Ussher, John, Esq. *Arthur's Club, St. James's-street, S.W.*
1844	*Vacher, George, Esq. *Manor-house, Teddington.*
1862	*Van der Byl, P. G., Esq., M.P. *Care of Mr. H. Blyth*, 17, *Gracechurch-st., E.C.*
1865	Vane, G., Esq. *Ceylon. Messrs. Price and Boustead.*
1856	*Vaughan, James, Esq., F.R.C.S. *Builth, Breconshire.*
1852	2240*Vavasour, Sir Henry M., Bart. 8, *Upper Grosvenor-street, W.*
1855	Vavasseur, James, Esq. *Knockholt, near Sevenoaks, Kent.*
1866	Venner, Captain Francis John S. *Dilston-house, Upper Norwood, S.E.; and Elmbank, near Worcester.*
1871	Vereker, Lieut.-Col. the Hon. Chas. Smyth. *The Avenue, Beulah-hill, S.E.*
1863	*Vereker, The Hon. H. P., LL.D., H.M. Consul at Charante. 1, *Portman-square, W.*
1862	Verner, Edward Wingfield, Esq , M.P. *The Aske, Bray, Ireland.*
1862	*Verney, Edmond H., Commr. R.N. 32, *South-street, Grosvenor-square, W.*
1837	*Verney, Major Sir Harry C., Bart., M.P., F.R.A.S. *Travellers' Club, S.W.;* 32, *South-street, Grosvenor-square, W.; and Claydon-house, Bucks.*
1857	Verrey, Charles, Esq.
1852	Verulam, James Walter, Earl of. *Gorhambury, near St. Alban's; Barry-hill, Surrey; and Messing-hall, Essex.*
1865	2250Vile, Thomas, Esq. 75, *Oxford-terrace, W.*

Year of Election.	
1865	*Vincent, M. C., Esq., Professor of Economic Geology and Metallurgy; Inspector of Mines, &c. *Cincinnati, U.S.; and* 127, *Strand, London.*
1857	Vincent, John, Esq. 4, *Granville-park, Blackheath, S.E.*
1871	Vine, Lieut. Wm. W., R.N. *Ivanhoe-villa, Waverley-road, Southsea.*
1858	Vines, William Reynolds, Esq., F.R.A.S. *Care of Sydney H. Vines, Esq., Guy's-hospital, E.C.; and* 4, *Thavies-inn, Holborn-hill, E.C.*
1872	Vivian, Hon. H. Crespigny. *Foreign-office, S.W.*
1863	*Vyvyan, Sir Richard Rawlinson, Bart., F.R.S. *Trelowarren, Cornwall.*
1852	Wade, Mitchell B., Esq. 66, *South John-street, Liverpool.*
1864	Wade, R. B., Esq. 13, *Seymour-street, Portman square, W.*
1863	Wade, Thos. F., Esq., C.B., H.B.M. Secretary of Legation. *Pekin, China.*
1853	2260*Wagstaff, William Racster, Esq., M.D., M.A.
1869	Waite, Charles, Esq., LL.D., Principal of St. John's College. *Weighton-road, South Penge-park, S.E.*
1863	Waite, Henry, Esq. 3, *Victoria-street, Pimlico, S.W.*
1867	*Waite, Rev. John.
1871	Wakley, Thos. Finsbury Septimus, Esq., C.E.
1870	*Walker, Albert, Esq. *Auckland Club, New Zealand. Care of L. C. Walker, Esq., 3, Hartley-villas, Lansdowne-road, Croydon.*
1862	Walker, Major-General C. P. Beauchamp, C.B. 97, *Onslow-square, S.W.; and United Service Club, S.W.*
1861	Walker, Edward Henry, Esq., Consul at Cagliari. *Care of Messrs. Drummond.*
1863	*Walker, Frederick John, Esq. *The Priory, Bathwick, Bath.*
1863	Walker, James, Esq., Managing Director of Madras Railway. 23, *Cambridge-square, Hyde-park, W.*
1859	2270*Walker, Colonel James T., F.R.S., Royal Engineers. *Dehra Doon, India. Care of Messrs. H. S. King and Co., Pall-mall, S.W.; and* 17, *Queensberry-place, Cornwall-road, South Kensington, S.W.*
1830	Walker, John, Esq., Hydrog. In dia Office. 31, *Keppel-street, Russell-square, W.C.*
1861	*Walker, John, Esq. 60, *Porchester-terrace, W.*
1858	*Walker, Captain John, H.M.'s 66th Foot. *Broom-hill, Colchester.*
1871	*Walker, Capt. J. B. *East Bank, Oxton, Birkenhead; and Old Calabar, near Bonny, West Africa.*
1864	Walker, R. B. N., Esq. *Care of Mr. Bissett, 38, South Castle-st., Liverpool.*
1863	*Walker, T. F. W., Esq. 6, *Brock-street, Bath; and Athenæum Club, S.W.*
1853	Walker, Captain Sir William Harrison, H.C.S. 3, *Gloucester-terrace, W.; and Board of Trade, S.W.*
1861	Walker, Rev. William. *Grammar-school, Hanbury-castle, Upton-on-Severn.*
1866	Walker, William, Esq., F.S.A. 48, *Hilldrop-road, Tufnell-park, N.*
1868	2280Walkinshaw, William, Esq. 74, *Lancaster-gate, Hyde-park, W.*
1854	*Wallace, Alfred Russell, Esq. *The Dell, Grays, Essex.*
1861	Wallace, Rev. Charles Hill, M.A. 5, *Hurley-place, Clifton, Bristol.*

Year of Election.	
1868	Waller, Major George Henry. 16, *Eaton-square, S.W.*
1864	Waller, Rev. Horace. *The Vicarage, Leytonstone.*
1865	Waller, Sir Thos. Wathen, Bart. 16, *Eaton-square, S.W.*
1863	Wallich, George C., Esq., M.D. 11, *Earl's-terrace, Kensington, W.*
1864	Walmsley, Joshua, Government Resident Agent. *Natal.*
1860	Walpole, Capt. the Hon. F., M.P. *Travellers' Club, S.W.; and Rainthorpe-hall, Long Stratton, Norfolk.*
1863	Walpole, Rt. Hon. Spencer, M.P., F.R.S. 109, *Eaton-square, S.W.*
1853	2290Walter, Henry Fraser, Esq. *Papplewick-hall, near Nottingham.*
1865	Walton, H. C., Esq., C.E. 26, *Savile-row, W.*
1863	Walton, J. W., Esq. 26, *Savile-row, W.*
1864	Walton, R. G., Esq., C.E. *Bombay.*
1853	*Ward, George, Esq.
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1862	Wardlaw, John, Esq. 44, *Prince's-gardens, Hyde-park, S.W.*
1868	Wardlaw, Major-General Robert, C.B. *United Service Club, S.W.*
1864	2300Warner, E., Esq. 49, *Grosvenor-place, S.W.*
1859	Warre, Arthur B., Esq. 109, *Onslow-square, S.W.*
1869	Warre, Major-General H. J., C.B. *United Service Club, S.W.*
1869	Warren, Charles, Esq. 17, *Hanover-street, Peckham, S.E.*
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1859	2310Watson, James, Esq. 24, *Endsleigh-street, W.C.*
1860	Watson, James, Esq., Barrister-at-Law. 13, *Circus, Bath.*
1861	Watson, John Harrison, Esq. 28, *Queensborough-terrace, Kensington-gardens, W.*
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1867	Watson, Robert Spence, Esq. *Moss Croft, Gateshead-on-Tyne.*
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1857	*Waugh, Maj.-General Sir Andrew Scott, Bengal Engineers, F.R.S., late Surveyor-General and Superintendent Great Trig. Survey. *Athenæum Club, S.W.; and* 7, *Petersham-terrace, Queen's-gate-gardens, South Kensington, S.W.*

Year of Election.	
1868	2320Webb, Edward B., Esq., C.E., &c. 34, *Great George-street, S.W.*
1858	*Webb, Capt. Sydney. *Oriental Club, Hanover-square, W.; and* 24, *Manchester-square, W.*
1862	*Webb, William Frederick, Esq. *Army and Navy Club, S.W.*
1836	*Webber-Smith, Major-General James, 95th Regiment.
1865	Webster, Alphonsus, Esq. 44, *Mecklenburgh-square, W.C.*
1864	Webster, E., Esq. *North-lodge, Ealing, W.*
1858	Webster, George, Esq., M.D. *Dulwich, S.E.*
1866	Webster, George, Esq. 40, *Finsbury-circus, E.C.*
1860	Weguelin, Thomas Matthias, Esq., M.P. *Peninsular and Oriental Steam Navigation Co., Moorgate-street, E.C.*
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1863	Welman, Charles, Esq. *Norton-manor, Taunton.*
1868	Wentworth, William Charles, Esq.
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1870	West, Raymond, Esq., Bomb. Civ. Serv. 12, *Lower Fitzwilliam-street, Dublin.*
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1872	Westendarp, Charles H., Esq. 51, *Lansdowne-road, Kensington-park, W.*
1863	2340*Westlake, John, Esq. 16, *Oxford-square, W.*
1853	Westmacott, Arthur, Esq. *Athenæum Club, S.W.*
1852	Weston, Alex. Anderdon, Esq., M.A. *River Court, Upper-mall, Hammersmith.*
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1830	*Weyland, John, Esq., F.R.S. *Woodrising-hall, Norfolk.*
1866	Wharncliffe, Lord. 15, *Curzon-street, W.*
1861	Wharton, Rev. J. C. *Willesden-vicarage, N.W.*
1858	Wheatley, G. W., Esq. 150, *Leadenhall-street, E.C.*
1859	Wheelwright, William, Esq. *Gloucester-lodge, Regent's-park, N.W.*
1869	Whichelow, James Sheier, Esq. 42, *Waltham-grove, Fulham, S.W.*
1853	2350*Whinfield, Edward Wrey, Esq., B.A. *South Elkington-vicarage, Louth.*
1839	*Whishaw, James, Esq., F.S.A. 32, *Harewood-square, N.W.*
1867	Whitaker, Thomas Stephen, Esq. *Everthorpe-hall, East Yorkshire; and Conservative Club, S.W.*
1868	Whitby, Rev. Thomas, M.A., &c. *St. John's-terrace, Woodhouse Moor, Leeds.*
1857	White, Arthur D., Esq., M.D. 56, *Chancery-lane, W.C.*
1865	White, Lieut. Arthur Wellesley, R.A. *Kingston, Canada. Care of Capt. T. P. White, R.E., Ordnance Survey, Edinburgh.*
1855	*White, Charles, Esq., J.P. 10, *Lime-st., E.C.; and Barnesfield-house, Dartford, Kent.*
1857	White, Henry, Esq. *The Lodge, Hillingdon Heath, near Uxbridge.*

Year of Election.	
1862	White, Major-General Henry Dalrymple, C.B. 39, *Lowndes-square, S.W.*
1869	White, Robert Owen, Esq. *The Priory, Lewisham, S.E.*
1866	2360White, W. A., Esq. *Civil Service Club, S.W.*
1852	White, William Foster, Esq. *Treasurer, St. Bartholomew's-hospital, E.C.*
1863	*White, William O., Esq. 10, *Lime-street, E.C.; and Barnsfield, near Dartford, Kent.*
1862	Whitehouse, William Matthew Mills, Esq. 46, *Chepstow-place, Bayswater, W.; and Hardwicke-house, Studley, Warwickshire.*
1865	Whymper, Edward, Esq. *Town-house, Haslemere.*
1864	Whyte, M. B., Esq. 115, *St. George's-road, S.W.*
1870	Whyte, W. Anthony, Esq. 19, *Norfolk-crescent, Hyde-park, W.*
1869	Whytt, Ebenezer, Esq. *The Grove, Highgate, N.*
1871	Wiggins, Joseph, Esq. (Exam. in Navig., &c.). 4, *The Elms, Sunderland.*
1870	Wilder, Frederick, Esq. *Purley-hall, Reading.*
1867	2370Wilkins, J. E., Esq. 4, *Paper-buildings, Inner Temple, E.C.*
1866	Wilkinson, Alfred, Esq. 14, *Elvaston-place South Kensington, S.W.*
1860	*Wilkinson, Major A. Eastfield, B.A. *Oudh Commission, India;* 7, *Cavendish-place, Brighton; and Army and Navy Club, S.W.*
1854	Wilkinson, Frederick E., Esq., M.D. *Sydenham, Kent, S.E.*
1865	Wilkinson, Dr. G. 4, *St. John's-wood-villas, St. John's-wood, N.W.*
1865	Wilkinson, J. J., Esq. 31, *Springfield-road, St. John's-wood, N.W.*
1839	*Wilkinson, Sir John Gardner, D.C.L., F.R.S. *Brynfield-house, Reynoldston, Gower, Glamorgan.*
1868	Wilkinson, James J., Esq.
1870	Wilks, George, Esq. *Boston Spa, Tadcaster, Yorkshire.*
1857	Willcock, J. W., Esq., Q.C. 6, *Stone-buildings, Lincoln's-inn, W.C.; and Rosenstead, Avenue-road, St. John's-wood, N.W.*
1872	2380Willems, Edouard Henri Léonard, Esq. 4, *York-street, St. James's-square, S.W.*
1869	Williams, Charles Henry, Esq. *Churchill-house, Churchill, Somersetshire.*
1863	Williams, Frederick G. A., Esq. *Chapel-stairs, Lincoln's-inn, W.C.*
1856	Williams, Henry Jones, Esq. 10, *Hereford-street, Park-lane, W.; and* 82, *King William-street, E.C.*
1856	Williams, Henry R., Esq. 183, *Camden-road, N.*
1857	Williams, Major-General Sir Wm. F., Bart., K.C.B., D.C.L., Commander-in-Chief, Canada. *Army and Navy Club, S.W.*
1867	Williams, W. Rhys, Esq., M.D. *Royal Bethlehem Hospital, S.*
1868	*Williams, Michael, Esq. *Treyullow, Scorrier, Cornwall.*
1868	*Williams, F. M., Esq. *Goonvrea, Penan, Arworthal, Cornwall.*
1859	Willoughby, Henry W., Esq. 35, *Montagu-square, W.*
1867	2390Wills, William Henry, Esq., J.P. *Hawthornden, Clifton Down, Bristol.*
1870	Wills, Peter Turner, Esq. *Blackheath-park, Blackheath, S.E.*
1868	Wilson, Alexander, Esq. 24, *Highbury-place, N.*
1869	Wilson, Captain Charles William, R.E. 4, *New-street, Spring-gardens, S.W.*
1865	Wilson, E., Esq. *Hayes-place, Bromley, Kent.*

Year of Election.	
1872	Wilson, John Peter, Esq. *The Mount, Totnes, South Devon.*
1872	Wilson, Robert B. W., Esq. 3, *Beaufort-gardens, W.*
1862	*Wilson, Robert Dobie, Esq. 15, *Green-street, Grosvenor-square, W.*
1869	Wilson, Samuel King, Esq. 3, *Portland-terrace, Regent's-park, N.W.*
1869	Wilson, Rev. T. Given, B.A. 23, *Wynell-road, Forest-hill, S.E.*
1854	2400*Wilson, Captain Thomas, R.N.
1872	Wilson, Lieut. William Thomas, R.E. *Camp, Aldershot; and Messrs. Cox and Co., Craig's-court.*
1860	Wilson, Thomas, Esq. 38, *De Beauvoir-road, Kingsland, N.*
1866	Wiltshire, Rev. Thomas, M.A., F.G.S., F.L.S. 25, *Granville-park, Lewisham, S.E.*
1868	*Winch, W. Richard, Esq. *Chislehurst, Kent.*
1870	Winchester, C. A., Esq. *Oriental Club, W.*
1846	*Winchester, Right Rev. Samuel Wilberforce, Lord Bishop of, F.R.S., F.S.A. 19, *St. James's-square, S.W.*
1862	Wing, Commr. Arthur, R.N. *Care of Messrs. Case and Loudensack.*
1863	Wingate, T. F., Esq. 18, *Albion-street, Hyde-park-square, W.*
1870	Wiseman, James, Esq. 1, *Orme-square, Bayswater, W.*
1870	2410Wiseman, Lieut. W., R.N. 88, *Belgrave-road, S.W.; and Lagos, W. Africa. Care of Messrs. Case and Loudensack,* 1, *James-street, Adelphi, W.C.*
1864	Wodehouse, J. H., Esq., H.M.'s Commissioner and Consul-General for the Sandwich Islands.
1870	Wodehouse, Sir Philip, K.C.B. *Care of E. R. Wodehouse, Esq.*, 17, *Half-moon-street, Piccadilly, W.*
1865	Wolfe, Captain William Maynard, R.A. *Arts Club, Hanover-square, W.*
1866	*Wolff, Sir Henry Drummond, K.C.M.G. 15, *Rutland-gate, S.W.; and Athenæum Club, S.W.*
1863	Wood, Henry, Esq. 10, *Cleveland-square, Hyde-park, W.*
1865	Wood, Lieut.-Colonel Wm., R.M. 4, *Hyde-park-terrace, Cumberland-gate, W.*
1868	*Wood, Richard Henry, Esq., F.S.A. *Crumpsall, near Manchester.*
1872	Wood, Captain Alexander (Bombay Staff Corps). 6, *Quadrant-road, Highbury-new-park; and* 14, *St. James's-square, S.W.*
1870	Wood, Captain T. P. *Holly-bank, Rusthall, Tunbridge Wells.*
1857	2420Woodhead, Major H. J. Plumridge. 44, *Charing-cross, S.W.*
1867	Woodifield, Mathew, Esq., M.I.C.E. *General Colonial Manager, Cape Copper Mining Co., Namaqualand, Cape of Good Hope.*
1862	Woods, Samuel, Esq. *Mickleham, near Dorking, Surrey.*
1864	Woolcott, George, Esq. 78, *Palace-gardens-terrace, Kensington, W.*
1863	*Worms, George, Esq. 17, *Park-crescent, Portland-place, W.*
1845	Worthington, Rev. James, D.D. 27, *John-street, Bedford-row, W.C.*
1856	Worthington, J. Hall, Esq. *Alton-hill, Oxton, near Birkenhead.*
1866	*Worthington, Richard, Esq. 7, *Champion-park, Denmark-hill, S.E.*
1857	Wortley, Rt. Hon. James Stuart, Q.C. 29, *Berkeley-square, W.; and Sheen, Surrey, S.W.*
1866	Wotton, William G., Esq., M.D. 15, *Clement's-inn, W.C.*

Year of Election.	
1839	2430*Wyld, James, Esq. *Charing-cross, W.C.*
1863	Wylde, W. H., Esq. *Foreign-office, S.W.*
1871	Wynne-Finch, Charles, Esq. 4, *Upper Brook-street, W.*
1867	*Wythes, George Edward, Esq. *Epping, Essex.*
1869	Yardley, Sir William. *Hadlow-park, Tunbridge, Kent.*
1854	Yeats, John, Esq., LL.D. *Clayton-place, Peckham, S.E.*
1861	York, Most Rev. William Thomson, Archbishop of, F.R.S. *Bishopsthorpe, York.*
1859	Yorke, Lieut.-General Sir Charles, K.C.B. 19, *South-st., Grosvenor-square, W.*
1830	*Yorke, Colonel Philip J., F.R.S. 89, *Eaton-place, S.W.*
1857	*Young, Allen, Esq. 1, *St. James's-street, S.W.*
1838	2440*Young, Charles Baring, Esq. 4, *Hyde-park-terrace, W.*
1830	*Young, George Frederick, Esq. *Limehouse, E.*
1830	*Young, James, Esq.
1858	Young, James, Esq. *Kelly, Wemyss Bay, by Greenock.*
1866	Young, John, Esq., F.S.A. *Vanbrugh-fields, Blackheath, S.E.*
1865	Young, Rev. R. H., B.A. *Royal Naval School, New Cross, S.E.*
1857	Yule, Colonel Henry, C.B., Bengal Engineers. *Messrs. Grindlay & Co., 55, Parliament-street, S.W.*
1865	Zouche, Robert Curzon, Lord de la. *Parham-park, Steyning, Sussex; and Arlington-street, W.*
1864	2448Zwecker, J. B., Esq. 55, *Patshull-road, Kentish-town, N.W.*

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Edinburgh, Royal Society of
———, The Library of Advocates
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——— . . . . Soc. of Natural History
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AGASSIZ, L.—Address on A. von Humboldt. Boston, 1869. The AUTHOR.

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.. .. Library of Civil Engineers, 1866 to 1870. The INSTITUTION.

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GARCIA Y GARCIA.—Derrotero de la Costa del Peru. Lima, 1870. The AUTHOR.

GARDINER, G.—Travels in the Interior of Brazil. 1846 .. By PURCHASE.

GARNIER, J.—Excursion autour de l'Ile de Tahiti. Paris, 1869.

GENOUILLY, R. DE.—Annuaire des Marées de Côtes de France, 1870. Paris, 1869 .. .. DÉPÔT DES CARTES ET PLANS.

GEVREY, A.—Essai sur les Comores. Pondichery, 1870 .. By PURCHASE.

GINSBURG, C. D.—The Moabite Stone. 1870 .. .. The AUTHOR.

GODMAN, F. DU C.—Natural History of the Azores or Western Islands. 1870. By PURCHASE.

GORDON, C. G., History of Chinese Campaign under. By A. Wilson. 1868. By PURCHASE.

GOULD, B. A.—The Transatlantic Longitude. Washington, 1869. The AMERICAN ACADEMY OF ARTS.

GRANEL, J.—Discursos para fijar la Capital de la Nacion. Buenos Aires, 1867. W. BOLLAERT, Esq.

GRAS, A. LE.—Annales hydrographiques, 1869. Paris, 1869. DÉPÔT DES CARTES ET PLANS.

.. .. Le Sud d'Espagne. Paris, 1869.

.. .. Description des Côtes du Royaume de Portugal. Paris, 1869. DÉPOT DES CARTES etc.

GREY, G.—Polynesian Mythology. 1855 .. .. .. By PURCHASE.

GRIESBACH, C. L.—The Geology of Natal, S. Africa. 1871. The AUTHOR.

GRIEVE, J.—Kamtschatka and the Kurilski Islands. Gloucester, 1764. By PURCHASE.

GRIFFIN, L. H.—The Rajas of the Punjab. Lahore, 1870. The PUNJAB GOVERNMENT.

GRIFFITH, W.—Journals of Travels. Calcutta, 1847 .. By PURCHASE.

Guiana.—Geological Survey of British Guiana. Newspaper Extract. Demerara, 1870.

HAHN, T.—Die Sprache der Nama. Leipzig, 1870 .. .. The AUTHOR.

HALCOMBE, F. J.—Mission Life. 1870-71 .. .. .. The EDITOR.

HALL, W.—Our National Defences. Kensington, 1871 .. The AUTHOR.

HALLORAN, A. L.—Visits to Loochoo, Japan, etc. 1856 .. By PURCHASE.

HANN, D. J., and C. JELINEK.—Zeitschrift der Oesterr. Gesellsch. für Meteorologie. Wien, 1870 .. .. The EDITORS.

HARDY, C.—Forest Life in Acadie. 1869 .. .. .. By PURCHASE.

HAYNES, S. L.—Ramble in New Zealand Bush. 1870 .. The AUTHOR.

Titles of Books. *Donors.*

HAYWARD, G. W.—Vocabularies of Dardistan, etc. Lahore, 1870. The INDIA OFFICE.

. . . . . (*See* Thornton.)

HAZLEWOOD, E.—Colonies on the Uplands of the Amazon. 1863. W. BOLLAERT, Esq.

HEATHERINGTON, A.—The Gold Fields of Nova Scotia. 1870. The AUTHOR.

HECTOR, J.—On Coal Deposits of New Zealand. 1866 .. The AUTHOR.

. . . . . On the Colonial Museum, New Zealand. 1869-70. The AUTHOR.

HELMERSEN, G.—Notiz über die Berge Aktan etc. St. Petersburg, 1870. The IMPERIAL ACADEMY.

. . . . . Ueber die Braunkohlenlager bei Smela. 1869. The IMPERIAL ACADEMY.

HIRSCH, A., and E. PLANTAMOUR.—Nivellement de Précision de la Suisse. Geneva, 1870-71 .. .. The AUTHOR.

HITCHCOCK, C. H.—Geology, etc., of New Hampshire. Manchester, 1869. The AUTHOR.

HOCHSTETTER, Dr.—Die geologischen Verhältnisse der Europäischen Türkei. Wien, 1870 .. .. The AUTHOR.

HOCKIN, J. P., and G. KEATE.—Account of the Pelew Islands of Capt. H. Wilson. 1803 .. .. A. G. FINDLAY, Esq.

HODGES, W.—Travels in India. 1793 .. .. .. By PURCHASE.

HOLLAND, T. J., and H. M. HOZIER. Sir H. James.—Record of the Expedition to Abyssinia. 1870 .. .. WAR OFFICE.

HONDIUS, D'.—Atlas de G. Mercator. 1615 .. .. By PURCHASE.

HORSEY, A. P. R. DE.—The African Pilot. 1865 .. .. The ADMIRALTY.

HOSKYN, R.—Sailing Directions for the Coast of Ireland. 1866. The ADMIRALTY.

HOWELL. J.—Instructions for Forrein Travell. 1650. (*See* Arber.)

HOZIER, H. M. (*See* Holland.)

IDES, YSBRANT.—Moscow overland to China. 1786 .. By PURCHASE.

IMRAY, J.—North Pacific Pilot. Part I. 1870 .. .. The AUTHOR.

India.—Lettere dell' I. Vinegia, 1558 .. .. .. By PURCHASE.

Insurance.—Annual Report of Insurance Department. New York, 1869. 2 vols. The AMERICAN GEOGRAPHICAL SOCIETY.

Iquitos.—El progreso del apostadero de Iquitos. Lima, 1869. W. BOLLAERT, Esq.

IRBY, A. P.—Travels in the Slavonic Provinces of Turkey. 1867. By PURCHASE.

ISTRIA, DORA D'.—Fyletia e Arbenoré prej Kanekate Laoshima ne Livurne. 1867 .. .. The AUTHORESS.

JAMES, Sir H. (*See* Hozier.)

. . . . . Catalogue of Maps, Plans, etc., of the Ordnance Survey of Ireland. 1869 .. .. The WAR OFFICE.

JARDINE, W.—Memoirs of H. E. Strickland. 1858 .. .. By PURCHASE.

JARRICI, R. P. (Tholasani.)—Thesaurus Rerum Indicarum. 1611. Coloniæ Agrippinæ, 1615.

JAUBERT, P. A.—Voyage en Arménie et en Perse. Paris, 1821. By PURCHASE.

JELINEK. (*See* Hann.)

Titles of Books. *Donors.*

JOANNE, A.—Itinéraire général de la France. Vosges et Ardennes. Paris, 1868. By PURCHASE.

JOHNSON, E. J.—Railroad to the Pacific, etc. New York, 1854.

JOHNSTON, K.—Middle Class Series, Brit. Empire Atlas .. PRESENTED.

Juan Fernandez, Earthquake of, and Talcahuana, in 1835 .. PRESENTED.

JULIEN, S. (*See* Champion.)

KAEMPER, ENG.—Amœnitatum exoticarum. Lemgoviæ, 1712. By PURCHASE.

KAISER, F.—Annalen der Sternwarte in Leiden. Haag, 1870. The DIRECTOR.

KEAT, G. (*See* Hockin.)

KELLER, J. e F.—Exploração do Rio Madeira. 1869 .. The AUTHORS.

KENNEDY, A. J.—La Plata, etc., during the War. 1869 .. The AUTHOR.

KESSLER, J.—An Introduction to the Language, etc., of Madagascar. 1870. The AUTHOR.

KIDD, S.—Illustrations of the Chinese. 1841 .. .. By PURCHASE.

KING, T. B.—California the Wonder of the Age. New York. 1850. W. BOLLAERT, Esq.

KING, W. Ross.—Aboriginal Tribes of the Nilgiri Hills. 1870. The AUTHOR.

KINGSLEY, H.—Eyre, the South Australian Explorer .. Sir R. I. MURCHISON.

KIRCHER, A.—China Monumentis etc. Amstelodami, 1667. By PURCHASE.

KLAPROTH.—Asiatisches Magazin. 2 vols. Weimar, 1802.. By PURCHASE.

KNIGHT, H. G.—The Normans in Sicily. 1838 .. .. By PURCHASE.

..... Architectural Tour in Normandy. 1841 .. By PURCHASE.

KNOX, T. W.—Overland through Asia. 1871 .. .. The AUTHOR.

KOLDEWEY, K.—Die erste Deutsche Nordpolar-Exped. 1868. Gotha, 1871. A. PETERMANN.

KONER, W.—Zeitschrift für Erdkunde zu Berlin, 1870. Berlin. The EDITOR.

KOTZEBUE, OTTO.—Voyage into the South Sea, etc. 1821. 3 vols. By PURCHASE.

KRABBE, K.—Bitrag til Kundskabom af K. K. Kjöbenhavn. The DANISH SOCIETY OF SCIENCE.

LACROZE, F. y J.—Projecto presentado á las Hon. Cam. Legislativas. Buenos Aires, 1866.

LAFONT. (*See* McDougall.)

LAMONT, J.—Seasons with the Sea-horses. 1861 .. .. By PURCHASE.

LAUGHTON, J. K.—Physical Geography. 1870 .. .. The AUTHOR.

LAVERDIÈRE, C. H.—Œuvres de Champlain. Quebec, 1870. M. G. E. DESBARATS.

LEGGE, J.—Chinese Classics. Vol. III. .. .. C. MORRISON, Esq.

LEGH. (*See* Macmichael, W.)

LEMPERTZ, M.—Antiquarisches Bücherlager in Bonn. 1871. H. W. BATES, Esq.

LENNEP, J. VAN.—Travels in little known parts of Asia Minor. 1870. By PURCHASE.

LEWIS, T.—State Rights, etc. Albany, 1865. The AMERICAN GEOGRAPHICAL SOCIETY.

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Titles of Books. *Donors.*

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The HYDROGRAPHER TO THE ADMIRALTY.

LINTH. (*See* Bürkli.)

LOESCHERO, A.—Pausaniæ de tota Græcia. Libri decem. Basileæ. 1551.
Sir R. I. MURCHISON.

LOTTIN DE LAVAL.—Voyage dans la Péninsule arabique. Paris, 1855–59.
By PURCHASE.

LUARD, W.—Rangoon and Western China. 1870.

.. .. Report on Railway Communication with the Shan States from the Port of Rangoon. 1865 .. .. T. T. COOPER, Esq.

LUBBOCK, J.—Origin of Civilisation, etc. 1870 .. .. By PURCHASE.

MACGREGOR, J.—A Thousand Miles in the *Rob Roy* Canoe. 1871.

.. ..The Voyage alone in the Yawl *Rob Roy*. 1868.

.. ..The *Rob Roy* on the Baltic. 1867 .. The AUTHOR.

MACKENZIE, G. M.—The Turks, the Greeks, and the Slavons. 1867
By PURCHASE.

MACMICHAEL, W., and LEGH.—Journey from Moscow to Constantinople in 1817 and 1818 .. .. By PURCHASE.

Madeira, Traveller's Guide to. 1814.

MAGE, E.—Voyage dans le Soudan occidental. Paris, 1868. By PURCHASE.

MAGNO DE CASTILHO, A.—Découvertes portugaises en Afrique. Lisbonne. 1870.
The AUTHOR.

MAJOR, R. H.—Select Letters of C. Columbus. 1870. The HAKLUYT SOCIETY.

MALTZAN, H. F.—A. von Wrede's Reise in Hadramaut. Braunschweig, 1870.
By PURCHASE.

MARKHAM, C. R.—Catalogue of Maps of British Possessions in India and other Parts of Asia. 1870 .. .. C. R. MARKHAM, Esq.

.. .. Letter to the Under Secretary of State for India on the Marine Surveys of India. 1871 .. .. .. C. R. MARKHAM, Esq.

MARKHAM, C. R.— *See* Alabaster.)

MARNO, E.—Von Dabbeh nach Omderman durch die westliche Bajuda-Steppe. Chartum, 1870 .. .. PRESENTED.

MARQUETTE, P.—Voyage, etc., de l'Amérique septentrionale. Paris, 1781.
By PURCHASE.

MASTERMAN, G. T.—Seven Eventful Years in Paraguay. 1869. By PURCHASE.

MCDOUGALL, G. F.—Ins. nautiques pour la Côte sud-est de la Nouvelle-Écosse et la Baie de Fundy. Traduit par J. Lafont. Paris. 1869.
DÉPÔT DES CARTES etc.

MEARES, J.—Voyages from China to the N.W. Coast of America. 1790.
By PURCHASE.

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Titles of Books. *Donors.*

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MONETA, P.—Ferro-carril Central Argentina desde Cordoba etc. Buenos Aires, 1867.

MORELL, J. R.—Scientific Guide to Switzerland. 1867 .. By PURCHASE.

MORRISON, W., and Dean Stanley.—The Recovery of Jerusalem. 1871. Edited by. EXEC. COM. OF PALESTINE EXPLOR. FUND.

MOXON, J., Likeness of. (Engraving.)

MOZOBAMBA.—Documentos encontrados ultimamente en el Archivo Oficial de M. Lima, 1860 .. .. W. BOLLAERT, Esq.

MUHRY, A.—Ueber die Lehre von den Meeresströmungen etc. Göttingen, 1869. The AUTHOR.

MURPHY, B. F.—Memoir on the Gold Coast. (MSS.) 1837. W. D. COOLEY, Esq.

Natal.—Land Colonization Company Correspondence. 1868. Dr. MANN.

NEGRI, Christoforo, Discorso del 30 Aprile, 1871 .. .. The AUTHOR.

NEIL, A.—Report on the Meteorology of the Punjab. Lahore, 1870. The INDIA OFFICE.

NEUMAYER, G.—Magnetic Survey of the Colony of Victoria. Mannheim, 1869. C. H. W. LIGAR, Esq.

New Grenada.—Report on Foreign Debt of New Grenada. 1861. W. BOLLAERT, Esq.

New Hampshire, Report on the Geology and Mineralogy of. Manchester, 1869. C. H. HITCHCOCK, Esq.

New Jersey.—State Geologist's Report for 1869. Trenton, 1870. The AMERICAN GEOGRAPHICAL SOCIETY.

NEWTON, C. T.—Travels and Discoveries in the Levant. 1865. By PURCHASE.

New York, Antiquities of the State of. Buffalo, 1851 .. By PURCHASE.

.. .. Agricultural Society of. 1867.

.. .. Hospital Report. 1867.

.. .. Insurance Department. 1869.

.. .. Adjutant-General's Report. 1865.

.. .. Report of the Regents of the University.

.. .. Report of the Sick and Wounded Soldiers of the State. Albany, 1865.

.. .. Report on the State Cabinet of Natural History. Albany, 1869.

.. .. Annual Message of the Governor of the State. 1870.

.. .. Report of the Character of Commerce. 1869.

.. .. Association for Improving the Condition of the Poor. 1869.

.. .. Reports on the Rinderpest. Albany, 1867.

.. .. Reports of the Commissioners of Patents. 1863.

.. .. Metropolitan Fire Department of the State. 1870.

.. .. Report of the Cooper Union. New York, 1870.

.. .. Rules, etc., of the Greenwood Cemetery. New York, 1870.

.. .. Journal of the American Geographical Society. The AMERICAN GEOGRAPHICAL SOCIETY.

Nicobar Islands, Papers relating to. No. 77, Home Department. Calcutta, 1870 .. .. The INDIA OFFICE.

Titles of Books. *Donors.*

NIEMANN, G. K.—Bloemlezing uit Maleische Geschriften. 's Gravenhage, 1870 .. .. The AUTHOR.

NORONHA, GARCIA DE. (*See* J. de Castro.)

OETTINGEN, A.—Meteorologische Beobachtungen, angestellt in Dorpat. 1869. The AUTHOR.

Oregon and California, Geographical Memoir on. 1870. The AMERICAN GEOGRAPHICAL SOCIETY.

ORMEROD, G. W.—Classified Index to the Transactions, Proceedings, and Quarterly Journals of the Geological Society of London. 1870. The AUTHOR.

OROÑO, N.—Expedicion á el Rey en el Chaco. Rosario, 1867. W. BOLLAERT, Esq.

OSTEN-SACKEN and RUPRECHT, F. J.—Reise im mittleren Tian-Schan, 1869. St. Petersburg .. .. Sir R. MURCHISON.

OTTER, H. G.—Sailing Directions, West Coast of Scotland. 1867. The ADMIRALTY.

OXENHAM. (*See* Alabaster.)

PAEZ, RAMON.—Travels in South and Central America. 1868. By PURCHASE.

PALGRAVE, W. G.—Journey through Central and Eastern Arabia. 1866. By PURCHASE.

PALMER, G.—Kidnapping in the South Seas. Edinburgh, 1871. The AUTHOR.

Panjab, Sanitary Administration of. 1869 .. .. The INDIA OFFICE.

.. .. .. Report on the Famine in the Panjab. Lahore, 1870. The INDIA OFFICE.

Paraguay.—La Guerra del P. Buenos Aires, 1867 .. W. BOLLAERT, Esq.

PARKMAN, F.—Discovery of the Great West. Boston, 1869. H. W. BATES, Esq.

Parliamentary Reports.—South Sea Islanders. 1871.

.. .. Correspondence respecting Emigration. 1871.

.. .. Federation of the Leeward Islands. 1871.

.. .. Military Stations and Railways in England, etc.

.. .. Summary of the Cruize round the World, under the orders of Rear-Admiral Hornby.

.. .. India (Cotton Reports). 1871.

.. .. India. Sladen on the Rhamo Route, British Burmah. 1871.

.. .. Education, Trinidad. 1870. The Hon. ARTHUR RUSSELL.

PARROT, F.—Reise zum Ararat. Berlin, 1838 .. .. By PURCHASE.

PARSONS, A.—Travels in Asia and Africa. 1818 .. .. By PURCHASE.

PATTERSON, A. J.—Magyars, their Country and Institutions. 1869. By PURCHASE.

PAZ SOLDAN, M. R.—Meteorológicas Obs. hechas en Lima. Lima, 1870. The AUTHOR.

.. .. Almenaque del Departimiento de Arequipa. Lima, 1858. W. BOLLAERT, Esq.

PENISTON, W. M.—Catalogue of Contributions from the Colony of Natal. 1862. Dr. MANN.

PENN, J.—Sailing Directions, West Coast, France, Spain, and Portugal. 1867. The ADMIRALTY.

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Pilots.—North Sea Pilot. Pt. II. N. and E. Coasts of Scotland. 1868.	
.. .. .. North Sea Pilot. Pt. III. East Coast of England. 1869.	
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.. .. .. The Bothnia Pilot. 1856.	
.. .. .. Pilot de la Mer Noire. Par M. H. de la Planche. Paris, 1869.	
.. .. .. The Vancouver Island Pilot. 1864.	
.. .. .. The African Pilot from River Cameroon to Cape of Good Hope. Lt. Com. G. F. McDougall. 1868.	
.. .. .. The African Pilot. Cape of Good Hope to Guardafui. Capt. A. P. R. De Horsey. 1865.	
.. .. .. The West India Pilot. Vol. II. The Caribbean Sea, Barbadoes, and Cuba, etc. Capt. E. Barnett. 1866.	
.. .. .. Spanish Coasting Pilot. Mediterranean, Balearic Islands, etc. Vol. II. 1814. Translated by F. Dougall.	The HYDROGRAPHER TO THE ADMIRALTY.
PIM, BEDFORD.—War Chronicle of 1870	The AUTHOR.
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POWELL, Capt. (*See* Ethersey.)	
PRATT, N. A.—Marls of S. Carolina. Philadelphia, 1868.	H. GOLDING, Esq.
QUARITCH, B.—Catalogue of Books for the Year 1870-71 ..	The PUBLISHER.
Radcliffe Observatory.—Results of Astronomical and Meteorological Observations. Vol. XXVII.	The TRUSTEES.
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RICCIOLI, R. P. J. B.—Geographiæ et Hydrographiæ. Venetiis, 1672.	By PURCHASE.
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Rinderpest, Reports on. Albany, 1867.	American Geographical Society.
Ritter's Geographisch-statistisches Lexikon. 2 vols. Leipzig, 1864.	By Purchase.
Rohlfs, G.—Von Tripolis nach Alexandrien. Bremen, 1871.	The Author.
Rosetti, E.—Ferrovia Trasandina. Buenos Aires, 1870.	W. Bollaert, Esq.
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..... The Stars, how to know them, etc. 1865..	J. Imray, Esq.
..... The Lights and Tides of the World, etc. 1869.	J. Imray, Esq.
Roujoux, H. de.—La Rade de Brest etc. Paris, 1868.	Dépôt des Cartes etc.
Ruprecht, F. J. (*See* Osten-Sacken.)	
Russia.—Revelations of R. *N. N.* 1844	By Purchase.
Sailing Directions.—For Candia and Crete. Capt. Spratt. 1866.	
..... West Coast of France, Spain, and Portugal. 1867.	
..... Views in the Baltic to accompany Klint's Sailing Directions. 1854.	
..... S.E. Coast of Nova Scotia. G. F. McDougall. 1867.	
..... Australian Views. N. E. Coast. *N. D.* and *N. C.*	The Hydrographer to the Admiralty.
Saint-Croix.—Examen critique des anciens Historiens. Paris, 1810.	By Purchase.
Sands, B. F.—Observations made at the United States Naval Observatory. Washington, 1870	The Secretary of the Navy.
Santa Fé, Las Colonias de. Rosario de Santa Fé, 1864 ..	W. Bollaert, Esq.
Saunders, T.—Sketch of the Mountains and River Basins of India, etc. 1870.	The Author.
Schmidt, F.—Reisen. Amurströme und Insel Sachalin. St. Petersburg, 1868.	
Schotto, And.—Litteræ Japonicæ anonym. 1609-10. Antverpiæ, 1615.	
Scott, R. H.—Barometer Manual, 1870	Board of Trade.
..... Translation of Dove's 'Law of Storms.' (*See* Dove.)	
Selwyn, A. R. C.—Physical Geography, etc., of Victoria. Melbourne, 1866.	
Senior, N. W.—Journal kept in Turkey and Greece. 1859.	By Purchase.
Seume, J. G.—Tour through Part of Germany. 1807 ..	By Purchase.
Sexe, S. A.—Mærker efter en Jistid, Omegnen af Hardanger Fjorden. Christiania, 1866.	
Sladen, E. B.—Expedition to Explore the Trade Routes to China *viâ* Bhamo. Calcutta, 1870.	
..... Trade through Burma to China. Glasgow, 1870.	The Author.
Smalley, G.—Meteorological Observations, Sydney Observatory. 1870.	

Titles of Books. *Donors.*

SMITH, C. P.—On an Equal Surface Projection and its Anthropological Application. 1870 .. .. The AUTHOR.

SMITH, R. B.—Italian Irrigation. 1855. 2 vols. and *Atlas.* By PURCHASE.

SNIDER, A.—Storia della Casa d'Austria etc. Paris, 1861.

.. .. Les Émanations. Recherches sur l'Origine et la Formation forcée et perpétuelle des Mondes. Paris, 1860.

.. .. Nouvelle Théorie sur la Formation des Comètes. Paris, 1861.

SONKLAR, K. K. Oberst C. VON.—Die Structur der Gletscher. Stuttgart, 1870. The AUTHOR.

SPRATT, T. A. B.—On the Evidences of the Rapid Silting in progress at Port Said. London, 1870.

SQUIER, E. G.—On the Geography and Archeology of Peru. 1870. The AUTHOR.

.. .. Honduras, Descriptive, Historical, and Statistical. 1870. The AUTHOR.

STANLEY, A. P., D.D. (*See* Morrison.)

STANSBURY, H.—An Expedition to the Valley of the Great Salt Lake of Utah. Philadelphia, 1852 .. .. W. BOLLAERT, Esq.

STOKES, H. J.—Selections. No. 115. Account of the Belgaum District in the Bombay Presidency. Bombay, 1870 .. .. The INDIA OFFICE.

STRAHLENBERG, P. J. v.—North Parts of Europe and Asia. 1738. By PURCHASE.

STREETER, G. L.—Newspapers, etc., published in Salem from 1768 to 1856. Salem, 1856 .. .. .. The AMERICAN GEOGRAPHICAL SOCIETY.

STUBEL, A.—Santorin. The Kaimeni Islands, from Observations by K. v. Fritsch, W. Reiss. 1867 .. .. By PURCHASE.

SWINHOE, R.—Reports of Special Mission to the River Yang Tsze Kiang. 1870. The INDIA OFFICE.

.. .. Narrative of the North China Campaign of 1860. By PURCHASE.

.. .. The Chinese Dialect spoken in Hainan. 1870. The EDITOR OF THE 'PHŒNIX.'

.. .. Natural History of Hainan. 1871 .. .. The AUTHOR.

TAYLOR, A. D.—On the Harbours of India. Liverpool, 1870. The AUTHOR.

Tehuantepec Railway.—Its Location, etc. New York, 1869. The RAILWAY DIRECTORS.

THOLASANI. (*See* Jarrici.)

THOMSEN, J.—Thermochemiske Undersogelser. Kjobenhavn, 1870. The AUTHOR.

THORNTON, E.—Gazetteer of Territories under E. I. Company. 1854. The INDIA OFFICE.

THUILLIER, H. L.—Surveys of India for Season 1868-69. The INDIA OFFICE.

THURLOW, T. J. H.—Report on the Amsterdam Exhibition of Domestic Economy. 1870 .. .. The AUTHOR.

TOWSON, J. T.—Tables to facilitate Great Circle Sailing, etc. 1861. The HYDROGRAPHER TO THE ADMIRALTY.

.. .. Tables for the Reduction of Meridian Altitudes. 1862. The HYDROGRAPHER TO THE ADMIRALTY.

Trade, The National Meeting of the Board of, held in Richmond, 1869. Boston, 1870.

Titles of Books. *Donors.*

TROW'S New York Directory, compiled by H. Wilson. 1868. The AMERICAN GEOGRAPHICAL SOCIETY.

TUCKETT, F. F.—Determination of Heights by means of the Thermo-barometer. 1871 .. .. The AUTHOR.

ULRICH, G. H.—Physical Geography of Victoria. Melbourne, 1866. The AUTHOR.

United States Survey.—Report of the Superintendent, Coast Survey. Washington, 1869 .. .. UNITED STATES SURVEY.

VÁMBÉRY, A.—Travels in Central Asia. 1864 .. .. By PURCHASE.

WALKER, J. T. — Great Trigonometrical Survey of India during 1869-70. Roorkee, 1870 .. .. The INDIA OFFICE.

WHEELER, J. T.—Voyage up the Irrawaddy to Mandalay and Bhamo. Rangoon, 1871 .. .. The INDIA OFFICE.

WHITE, W. A.—A Land Journey from Asia to Europe .. The AUTHOR.

WHITNEY, J. D.—The Yosemite Guide-book. California, 1869. The AUTHOR.

WILD, H.—Jahresbericht des physikalischen Central-Observatoriums für 1869. St. Petersburg, 1870 .. .. .. The IMPERIAL ACADEMY.

WILLIAMS, Capt.—Report on Railway Communication with the Shan States from the Port of British Burmah. 1865 .. .. J. J. COOPER, Esq.

WILLIAMS, J. J.—Tehuantepec Railway and Carriage Road across the Isthmus, etc. 1870 .. .. The AUTHOR.

WILLIAMSON, A.—Journeys in North China. 2 vols. 1870. The AUTHOR.

WILLIS, Dr. (*See* Alabaster.)

WILSON, H.—Account of the Pelew Islands. 1803. A. G. FINDLAY, ESQ.

WILSON, H. B.—Italian Irrigation. 2 vols. 1855 .. .. By PURCHASE.

WOLLZOGEN, Baron, and VON WURMB, Briefe des, auf ihren Reisen nach Afrika. Gotha, 1794 .. .. By PURCHASE.

WURMB. (*See* Wollzogen.)

WYLD, J.—The Diamond and Gold Fields of South Africa. The PUBLISHER.

YOUNG, F.—Transplantation the True System to Emigration. 1869. The AUTHOR.

YULE, C. B.—The Australian Directory, 1868 The HYDROGRAPHER TO THE ADMIRALTY.

ZEUSCHNER, H.—Vorkommen von Diceras Arietina. Warschau, 1870. The AUTHOR.

ZIEGLER, J. M.—Census of Switzerland. 1870 .. .. The AUTHOR.

ZITTEL, C. A.—Denkschrift auf C. E. H. von Meyer. München, 1870. The AUTHOR.

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Die Mittel und Ost-Alpen in ihrer orographischen Gruppirung. Nach Karl v. Sonklar K. K. Oberst. Bearbeitung der Karte von Herm. Berghaus und C. Vogel. Scale 1 inch = 25 miles (geo.). Red. von A. Petermann. Gotha, 1870 .. .. A. PETERMANN, Esq.

Three plans of the Nolla Thal (Canton Grisons). Scale $\frac{1}{10000}$. Wurster, Randegger, and Co. Winterthur, 1871. Prof. J. M. ZIEGLER.

TURKEY—

Uebersicht von G. Lejean's Reiserouten in der Turkei, 1857-1870. Scale 1 inch = 50 miles (geo.). Von A. Petermann. Gotha, 1870. A. PETERMANN, Esq.

ASIA.

CENTRAL—

Sketch Map of the Watershed between the River Systems of Southern and Central Asia, east of the Karakôram Pass. Scale 1 inch = 8 miles. By Robert B. Shaw .. .. .. The AUTHOR.

ARABIA—

A revised Map of 'Oman and the Persian Gulf, in which an attempt has been made to give a correct Transliteration of the Arabic Names. Scale 1 inch = 33 miles (geo.). By the Rev. George Percy Badger, F.R.G.S. 1871. .. .. HAKLUYT SOCIETY.

CHINA—

Sketch Map of some parts of Southern and Eastern Thibet, as used many years ago by Catholic Missionaries in those Countries. Scale 1 inch = 30 miles (geo.). A Tracing .. .. The INDIA OFFICE, through Mr. C. R. Markham, C.B.

The North-East Provinces of China, including the Coast from Chusan to the Gulf of Liau Tong, showing the Mineral and Silk Districts. Scale 1 inch = 20 miles (geo.). By John Markham, Esq., F.R.G.S. The AUTHOR.

A Tracing of the New Course of the Yellow River. By N. Elias, F.R.G.S. The AUTHOR.

Tracing of part of the Country to the North of Pekin. Scale 1 inch = 40 Li. By G. Goodall .. .. The AUTHOR.

INDIA—

MAPS of the GOVERNMENT SURVEY of INDIA, 259 Maps, on 1025½ sheets, viz.:—

GENERAL MAPS.

TITLE.	No. of Sheets.	Scale.	Date.
		Inches Miles	
Indian Atlas. Sheets 8, N.E.; 16, 27A, S.E.; 28, 30, 31, 41, 44A, S.W.; 45, N.W., S.W.; 51, N.W., N.E.; 69, N.W., N.E., S.W.; 70, N.W., S.W., S.E.; 71, N.W., N.E.; 87, S.W.; 90, S.E., 91, N.E., S.E.; 92, N.E.; 105, N.E.; 114 and 125, S.E.	28	1 = 4	
First Section of the North-West Series	2	1 = 4	1847–54
Sketch Map of India	6	1 = 32	1869
India. Skeleton Map; illustrating Lines of Telegraph in 1870	2	1 = 66	1870
Districts and Divisions of India	1	1 = 96	1862
Index to the Districts and Divisions of India. (5th Edition)	1	1 = 96	1868
Hand Map of India. No. 2. 2nd Edition	1	1 = 120	1870
Hand Map of India	1	1 = 125	1870
India. (No. 2A)	1	1 = 128	1869
Hand Map of India, No. 2 (Hills)	1	1 = 130	1870
India. (No. 1)	1	1 = 256	1869
Coast of India from Karachi to Singapore, showing positions of Wrecks during 1867	1	1 = 60	
Coast of India, from Karachi to Singapore. Showing Wrecks in 1866	1	1 = 60	1867
Northern India. On 7 sheets. Sheets 3, 4, and 7 only	3	1 = 16	1864–5
Telegraph Map of India in 1868	1	1 = 96	
Mountains of India and its Borders	1	1 = 180	1870
River Basins of India and its Borders	1	1 = 180	1870

BENGAL PRESIDENCY.

THE LOWER PROVINCES.

Bengal, Behar, and Orissa	1	1 = 32	1868
Postal Map of Bengal and Behar	1	1 = 32	1862
North-Eastern Frontier of Bengal	6	1 = 8	1865
Bootan, with the Bengal Dooars	1	1 = 8	1864
Cachar District	8	1 = 1	1864–8
The Eastern British Frontier bordering on Burmah and Muneepoor	1	1 = 8	1869
Country bo dering the Great Trunk Road, between Calcutta and Benares	1	1 = 8	1857
Country North of the Ganges, from Monghyr to Allahabad	1	1 = 8	1858
District of Bhaugulpoor	2	1 = 4	1846–50
Town of Bhaugulpoor	1	6 = 1	1867–8
District of Monghyr	17	1 = 1	1836–47
Do. do.	2	1 = 4	1845–7
Civil Station and Fort of Monghyr	1	6 = 1	1866–7
District of Purneah	2	1 = 4	1840–7
Do. of Bancoorah or West Burdwan	1	1 = 4	1854–6
Do. Bancoorah (Main Circuit Maps)	7	1 = 1	1854–6
Do. of Beerbhoom	1	1 = 4	1849–52
Do. Beerbhoom Main Circuit Maps)	13	1 = 1	
Do. Burdwan do. do.	11	1 = 1	1855–7

MAPS of the GOVERNMENT SURVEY of INDIA—*continued.*

BENGAL LOWER PROVINCES—*continued.*

TITLE.	No. of Sheets.	Scale.		Date.
		Inches.	Miles.	
District of Hooghly	1	1 =	4	1844–6
Districts of Midnapoor and Hijellee	1	1 =	4	1838–45
District of Chittagong	2	1 =	4	1835–41
Do. do.	3	1 =	4	1835–66
Station of Chittagong	1	12 =	1	
Districts Tipperah and Noacolly	4	1 =	4	1861–5
Civil Station of Comillah	1	8 =	1	1862–3
Province of Orissa	4	1 =	4	1837–42
District of Balasore	1	1 =	4	1838–42
Balasore or Northern Division of Cuttack	9	1 =	1	1838–42
Do. do. do. (2nd Edition)	9	1 =	1	1838–42
Central Division of Cuttack	16	1 =	1	1838–42
District of Cuttack (2nd Edition)	9	1 =	1	1838–42
Do. do.	1	1 =	4	1838–42
Killah Bankee (District Cuttack)	1	1 =	1	1837–41
Pooree or Southern Division of Cuttack	10	1 =	1	1837–41
Do. do. do. (2nd Edition)	8	1 =	1	1837–41
City of Juggernauth	1	8 =	1	1840–1
District of Backurgunje	1	1 =	4	1860–3
Do. Backurgunje. Main Circuit Maps. Nos. 1 to 21	12	1 =	1	1860–3
Civil Station of Burrisaul	1	16 =	1	1860–1
Do. and Cantonment of Silchar	2	12 =	1	1867
Districts of Dacca and Fureedpoor	2	1 =	4	1857–60
District Dacca. Main Circuit Maps. Nos. 1 to 14.	9	1 =	1	1857–60
Do. Fureedpoor. Main Circuit Maps. Nos. 1 to 9	5	1 =	1	
Do. Mymensing	2	1 =	4	1850–7
Do. Mymensing. Main Circuit Maps. Nos. 1 to 49	25	1 =	1	1850–7
Civil Station and Town of Mymensing	1	8 =	1	1853–4
District Sylhet	1	1 =	4	1860–5
Town of Sylhet	1	12 =	1	1863
District Jessore	1	1 =	4	1855–9
Do. do.	10	1 =	1	1855–9
Do. do. Main Circuit Maps. Nos. 1 to 22	13	1 =	1	1855–9
Civil Station of Jessore and Environs	1	1 =	8	1857–8
District of Nuddeah	1	1 =	4	1851–5
Do. Nuddeah. Main Circuit Maps. Nos. 1 to 10	11	1 =	1	1851–5
Civil Station of Kishnagur	1	12 =	1	1853–4
District of 24 Purgunnahs	1	1 =	4	1847–52
Do. do.	1	1 =	8	1847–63
Portion of District of 24 Purgunnahs, comprising Jurisdiction of the Baraset Magistrate	4	1 =	1	1848–52
Portion of District of 24 Purgunnahs, comprising Jurisdiction of the Allipoor Magistrate	8	1 =	1	1847–52
Plan of Barrackpore. Cantonment and Environs	1	6 =	1	1866–7
Map of South Behar	2	1 =	4	1841–6
District of Behar	1	1 =	4	1841–4
City of Gya and Sahib Gunje	1	8 =	1	1843
District of Patna	1	1 =	4	1841–3
Do. do.	15	1 =	1	1841–3
City of Patna	1	10 =	1	1865–6
Civil Station of Bankipoor	2	10 =	1	1864–5
District of Sarun	2	1 =	4	1843–6

MAPS of the GOVERNMENT SURVEY of INDIA—*continued.*

BENGAL LOWER PROVINCES—*continued.*

TITLE.	No. of Sheets.	Scale		Date.
		Inches.	Miles.	
District of Saiun	29	1 =	1	1843–8
District of Shahabad	1	1 =	4	1844–6
Do. do.	17	1 =	1	1844–6
Do. of Tirhoot	27	1 =	1	1846–9
Do. do.	2	4 =	1	1846–9
Do. do.	2	2 =	1	1846–9
Districts Dinajpoor and Bograh	2	1 =	4	1857–61
Do. do. do. Main Circuit Maps. Nos. 1 to 18	18	1 =	1	1857–61
Cantonment and Environs of Dinajpoor	2	6 =	1	1863–4
District of Maldah	1	1 =	4	1847–9
Do. Moorshedabad	1	1 =	4	1852–5
Do. do. Main Circuit Maps. Nos. 1 to 11	12	1 =	1	1852–5
Berhampoor. Cantonment and Environs	6	8 =	1	
District Pubnah	1	1 =	4	1853–5
City of Moorshedabad	1	8 =	1	1853–4
District Rajshahee (Rajshayee)	1	1 =	4	1848–51
Plan of Rampoor Bauleah	1	16 =	1	1867–8
District Rungpoor, including Kooch Behar	2	1 =	4	1856–60
Do. do. Main Circuit Maps. Nos. 2 to 22	18	1 =	1	1856–60
Cossyah and Garrow Hills. Sheets, 11, 12, 13, 16, 17, 21, and 22	7	1 =	1	
Cossyah and Garrow Hills	2	1 =	2	
Do. do. Index Map	1			
District Nowgong. Central Assam	1	1 =	4	1835–7
Do. of Seebpoor. Upper Assam	1	1 =	4	1839–42
Tea Districts of Assam	5	1 =	4	
Chota Nagpore. Topographical Survey. Sheets, 19, 20, 31, 32, 39, 40, 55, 56, 57, 58, 59, 64, 65, 70, 71, and Index	16	1 =	1	
Do. Degree Sheet. No. 10	1	1 =	4	
Civil Station of Ranchee and Cantonment of Dorundah	2	8 =	1	
Hazareebagh. Cantonment and Environs	4	6 =	1	1867–8
District Lohardugga	1	1 =	4	1863–9
Do. Manbhoom. Main Circuit Maps. Nos. 1 to 26	17	1 =	1	1861–7
Do. Manbhoom	4	1 =	4	1862–7
Do. Darjeeling (British Sikkim)	1¼	1 =	1	1861–7
Do. do. (Index Map)	3¼	2 =	1	1861–7
British Sikkim. Darjeeling Hill Territory and Morung Pergunnahs	2	1 =	4	1852
District Goalpara (Lower Assam)	1	1 =	4	1849–54
Killah Hindole (Cuttack Tributary Mehals)	1	1 =	2	1851–3
Do. Nyagurh do. do.	2	1 =	1	1852–3
Do. Talcheer do. do.	2	1 =	1	1853–61
Do. Ungool do. do.	4	1 =	1	1853–4

THE NORTH-WEST PROVINCES.

Country bordering the Great Trunk Road from Benares to Delhi	1	1 =	8	1857
Country round Agra	1	1 =	2	1870

MAPS of the GOVERNMENT SURVEY of INDIA—*continued.*

BENGAL NORTH-WEST PROVINCES—*continued.*

TITLE.	No. of Sheets.	Scale	Date.
		Inches. Miles.	
Allahabad. Cantonment, City, and Environs ..	6	6 = 1	1867–8
Town and Fort of Kalinjir	1	6 = 1	1868
Cawnpoor. Cantonment, City, and Environs	4	6 = 1	1867–8
Cantonments of Sikrol and Pandypoor, with City of Benares	2	6 = 1	1867–8
Town and Fort of Chunar (Chandelghar)	1	6 = 1	
Bareilly. Cantonment, City, and Environs	2	6 = 1	
Districts of Jhansee and Lulutpoor, with portions of Hunneepoor and Jalaon	2	1 = 4 chains	1852–61
City of Jhansee	1	1 = 4 miles	1858–9
Metalliferous Districts of Kumaon and Gurhwal ..	1	1 = 4	1855
Districts of Ajmere and Maiwara	2	1 = 4	1847–8
District of Ajmere	1	1 = 2	1847–8
OUDE.			
Oude Revenue Survey. Sheets, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 29, 30, 31, 32, 33, 34, 35, 36, 43, 44, 45, 46, and Index	37	1 = 1	
Lucknow Cantonments	4	6 = 1	1867
Lucknow, City, and Environs	1	6 = 1	1862–6
Roy Bareilly. City and Cantonments	1	1 = 10	1862–3
Sooltanpoor. Civil Station of	1	1 = 10	
PUNJAB.			
Punjab Map in 8 sections (sheet 5 not supplied) ..	7	1 = 8	1866–8
Punjab, Western Himalaya and adjoining parts of Thibet	1	1 = 16	1859
Punjab and its dependencies with portions of the North-West Provinces and Afghanistan	4	1 = 16	1870
North-West Frontier of the Punjab	1	1 = 16	1866
Tea Localities in the Punjab and North-West Provinces	1	1 = 16	1862
Operations of the British Army on the Sutlej	1	1 = 4	1845–6
District Umritsur (Amritsir)	1	1 = 2	1850–3
Umritsur. Cantonment and Environs	2	1 = 16 chains	1868–9
Goordaspoor District	1	1 = 2 miles	1850–2
Do. do.	6	1 = 1	
Butala Pergunnah (Goordaspoor District)	4	1 = 1	1850–2
Sealkote District	1	1 = 2	1851–3
Do. Cantonment and Environs	6	1 = 16 chains	1868–9
Delhi. Cantonment, City, and Environs	4	6 = 1 mile	1867–8
Hoshiyarpoor District	1	1 = 2	1847–9
Jalindhur District	1	1 = 2	1846–8
Do. Cantonment and Environs	6	6 = 1	1868–9
Kangra District	1	1 = 2	1847–52

MAPS of the GOVERNMENT SURVEY of INDIA—*continued.*

PUNJAB—*continued.*

TITLE.	No. of Sheets	Scale.	Date.
		Inches. Miles.	
Ferozepoor. Cantonment and Environs	4	6 = 1	1868–9
Lahore. City and Environs	6	6 = 1	
Do. do.	1	3 = 1	1868
Hazara. Military Map of	3½	1 = 2	1848–55
Attock. Fort and Environs	1	6 = 1	1868–9
Black Mountain and Country adjoining Ugore ..	1	1 = 2	1868
Operations of the Huzaruh Field Force	1	1 = 2	
Nowshera, Cantonment, Town, and Environs	3	6 = 1	1866–7
Peshawur, Cantonment, City, and Environs	4	6 = 1	1866–7
Jhelum and Rawal Pindi Districts, with portions of Leia, Shahpoor, and Hazara	2	1 = 4	1851–9
Campbellpoor, Cantonments, &c.	1	6 = 1	1865–6
Rawul Pindi. Cantonment, Town, &c.	1	6 = 1	1865–6
Thunaisur District	2	1 = 2	
Putteala, Jheend, Naba, &c., Jageers; and Rohtuk, Delhi, Goorgaon, and Hissar	4	1 = 2	1861–63
Umballa, Delhi, and Hissar Divisions	6	1 = 4	1868
CASHMERE.			
Kashmir and adjacent Mountains	4	1 = 2	1855–7
Do. Maharajah's Dominions	15	1 = 8	1868
RAJPOOTANA.			
Rajpootana. Topographical Survey. On 253 sheets. Sheets, 2, 2A, 3, 4, 5, 7, 8, 9, 10, 15, 16, 20, 21, 22, 24, 25, 26, 45, 46, 47, and Index	21	1 = 1	
Do. do. do. Degree Sheets. On 40 sheets. Sheets, 2, 3, 4, and 8 ..	4		
Do. and adjacent Countries	8	1 = 8	1846
Deoli Cantonment	1	5 = 1	1868
Jeypoor. City and Environs	1	1 = 1000 feet / miles	1865
Tonk. City and Environs	2	10 = 1	1868-9
INDORE.			
Central India (or Indore) Agency	1	1 = 16	1868
Gwalior and Central India Topographical Survey. On 101 sheets. Sheets, 1*a*, 1*b*, 1*c*, 2*a*, 2*b*, 3*a*, 3*c*, 4*a*, 4*b*, 5*b*, 7*a*, 8, 9*b*, 15, 26, 27, 30, 31, 31½, 32, 33, 34, 35, 36, 37	25	1 = 1	
Gwalior and Central India Survey. Degree Sheets. On 16 sheets. Sheets, 2 and 6	2	1 = 4	
Do. Territory and adjoining States	4	1 = 8	1847
Rewah and Bundelcund. Topographical Survey. On 50 sheets. Sheets, 16, 18, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 34, 40	14	1 = 1	
Do. Survey. Half Degree Sheets. On 17 sheets. Sheets, 3, 5, 6, 8, 7, 13	6	1 = 4	
Nagode. City and Cantonments	1	6 = 1	1867–8
Punna City	1	6 = 1	1868
Rewah City	1	6 = 1	1868

MAPS of the GOVERNMENT SURVEY of INDIA—*continued.*

CENTRAL PROVINCES.

TITLE.	No. of Sheets.	Scale.	Date.
		Inches Miles	
Central Provinces to illustrate introductory Chapter of Administrative Report ..	1	1 = 32	1862
Do. do. showing lines of Railway and Tramways	1	1 = 32	1862
Do. do. showing Railways proposed and Tramways in progress	1	1 = 36	1862
Do. do. indicating Mineral Resources and position of the Mohtoor Sanitarium ..	1	1 = 32	
Saugor and Nerbudda Territories	2	1 = 8	1861
Central Provinces and Vizagapatam Agency. Sheets, 3, 5, 6, and 17	4	1 = 1	
Do. do. with adjoining States	4	1 = 16	1865
Raepoor. Civil Station and Cantonments	4	1 = 16	1867–8
Dumoh District	1	1 = 4	1863–6
Jubbulpoor District. Main Circuit Maps. 11 sheets and Index	12	1 = 1	1854–62
Tehseel Bijeragogurh (Jubbulpoor)	1	1 = 4	1866–7
Sohagpoor and Ramgurh Districts of the Province of Gundawana	1	1 = 4	1842
Saugor District	6	1 = 2	1854–64
Seonee District and part of Mandla	1	1 = 4	1841
Nagpore District	1	1 = 4	1858–60
Do. and Wurdah Districts	4	1 = 2	1858–60
Do. City	6	16 = 1	1865
Hoshungabad District	19	1 = 1	1870
Do. do.	2	1 = 4	1862–7
Godavery, Bustar and Kalahundy Districts, showing teak and saul forests	1	1 = 12	1862
Jeypoor and Bustar Territories	1	1 = 8	1862–3

BERAR OR HYDRABAD DISTRICTS.

Berar	1	1 = 16	1870
Nurnulla Circar	8	1 = 1	1844–6
Bassim Circar	12	1 = 1	1846
Maiker Circar	6	1 = 1	1843–6
Gawilghur Circar	9	1 = 1	1845–50

HYDRABAD.

Bathulwaddy Circar	1	1 = 1	1843–4
Dowlutabad Circar	12	1 = 1	1847
Jaulnah Circar	9	1 = 1	1842–3
Kowlass Circar	4	1 = 1	1832
Kulliannee Circar	1	1 = 1	1833
Nuldroog Circar	4	1 = 1	1833
Patree Circar	4	1 = 1	1841–2
Purrainda Circar	4	1 = 1	1835
Pyton Circar	1	1 = 1	1842–3

BRITISH BURMAH.

Akyab District	1	1 = 4	1859–61
Tenasserim Province	6	1 = 4	
Do. do. and adjacent Provinces of the Kingdom of Siam ..	4	1 = 8	

MAPS of the GOVERNMENT SURVEY of INDIA—*continued.*

MADRAS PRESIDENCY.

TITLE.	No. of Sheets.	Scale.	Date.
Koondah Mountains, Coimbatore District	16	feet 1 = 1000	1851–2

BOMBAY PRESIDENCY.

Poonah, City of	1	Inch. Feet. 1 = 300	1851
Scinde, Province	4	miles 1 = 8	
Sindh, Revenue Survey, on 102 Sheets. Sheets 1, 2, 3, 4, 5, 6, 7, 8. 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 24, 25, 26, 27, 38, 39, 52, 68, 69, and Index	29	1 = 1	
Nowshera District	1	1 = 4	1860–3
Jacobabad, Shikarpoor, Rohree, Larkhana, and Mehur Districts	2	1 = 4	1856–62
Rohree, Sukkur, and Fort Bukkur	1	8 = 1	1856
Jacobabad Town and Cantonment	1	chains 1 = 10	1858–9

WESTERN ASIA.

Routes between Constantinople and India, also Telegraph Lines	1	miles 1 = 80	1867
Supposed Ruins of Babylon	1	yards 1 = 800	
Part of Mesopotamia, from Hillah to the Ruins of Niffer	1	1 = 4000	1861-2
Part of Mesopotamia, from Sheriat el Beytha to Tel Ibrahim	1	1 = 4000	1862–5

HER MAJESTY'S SECRETARY OF STATE FOR INDIA, through the India Office.

Maps, Charts, &c. *Donors.*

MS. Map of the Countries. Trans-Indus, including Dilail, Tangir, Hunzir, Nagar, Ponyal, Yassin, &c On the basis of the G. T. Survey of India, and from personal Exploration. By G. W. Hayward .. .. The AUTHOR.

Rough Plan of the South Gate of the Town of Tank, the scene of Sir Henry Durand's accident, on the 31st December, 1870. By Lieut.-Col. H. C. Johnstone. January 2nd, 1871.

SIAM—

Map of the Kingdom of Siam and her dependencies, among the Laosians and Cambodians, constructed from Surveys which the Siamese Government had made, 1867-68. Scale 1 inch = 13½ miles (geo.).
H. KING & Co., Cornhill.

TURKESTAN—

Map showing Routes from the Punjaub to Eastern Turkistan, to illustrate Memorandum by T. D. Forsyth, C.B. Scale 1 inch = 30 miles (geo.). Quartermaster-General's Office. Simla, 1868.

Map of a portion of Eastern Turkestan to illustrate the Expedition to

Maps, Charts, &c. *Donors.*

Yarkand undertaken under T. D. Forsyth, Esq., C.B., in 1870. Scale 1 inch = 28 miles (geo.). Calcutta, 1871.

Plan of the City of Yarkand. Scale 1 inch = 320 paces. Compiled and drawn in the Office of the Surveyor General of India, from a rough drawing and descriptions given by T. D. Forsyth, Esq., C.B Calcutta, 1870 .. .. The Author.

Turkey—

Turkey in Asia. Scale 1 inch = 50 miles (geo.). By John Arrowsmith. London, 1832 .. .. Miss Macqueen

Map of the Country South of Trebizonde, showing supposed site of Mount Theches (of Xenophon). By M. Rorit .. .. The Author.

AFRICA.

Collection of Maps of Africa, the property of the late James Macqueen, Esq., F.R.G.S. Presented by Miss Macqueen, viz. :—

Map of Africa. Scale 1 inch = 112 miles (geo.). By James Macqueen. London, 1841.

Carte Physique et Politique de l'Afrique. Scale 1 inch = 210 miles (geo.). Par A. H. Brué. Paris, 1833.

Another Edition of the above. 1825.

General Map of Africa. Scale 1 inch = 240 miles (geo.). By J. and G. Menzies.

Continente Africano, etc., extrahido de um Mappamundi exsistente no Museo Britannico por ordem do Conde da Lavradio em 1860. (Fac-simile.) Antonio Sancesafes. 1823.

Africa, extrahido do Atlas MS. feito por Diogo Homem em 1558, exsistente no Museo Britannico. Publicado pelo Conde de Lavradio em 1860. (Fac-simile.) 2 sheets.

Arabia, Egypt, Abyssinia, Red Sea, etc. Scale 1 inch = 90 miles (geo.). By Thomson. London, 1814.

Map of Africa, from Loando in the South to Tripoli in the North. Scale 1 inch = 110 miles (geo.). By James Macqueen. London, 1840. 2 copies.

Nubia and Abyssinia. Scale 1 inch = 55 miles (geo.). By John Arrowsmith. London, 1842.

Abyssinia, constructed from the latest and best authorities. By James Macqueen, Esq., with additions by Major Harris. Scale 1 inch = 52 miles (geo.). London, 1843.

Map of Africa, from 7° to 15° North Latitude, and from 36° to 48° East Longitude. Scale 1 inch = 30 miles (geo.). 3 copies. By James Macqueen, Esq. London, 1843.

Southern Half of a Map of Africa. Scale 1 inch = 230 miles (geo.). By J. Arrowsmith. London, 1850.

Map of Africa, from 5° South Latitude to 18° North Latitude, and from 5° to 44° East Longitude. Scale 1 inch = 115 miles (geo.). By James Macqueen, Esq. London, 1843.

Karte des Theils von Abyssinien der zwischen Massua und dem Dembea-See liegt, nach eigenen astronomischen Beobachtungen entworfen von Dr. Edouard Ruppell. 1834. Scale 1 inch = 22 miles (geo.).

Mappa da Costa Oriental da Africa desde Cabo-Delgado até Moçambique. Scale 1 inch = 10 miles geo. .

Zambezia e Sofalla. Mappa coordenado sobre numerosos documentos antigos e modernos, portuguezes e estrangeiros. Pelo V^de de Sá Bandeira. 1851. Scale 1 inch = 48 miles (geo.).

Angola, Mappa coordenado pelo Visconde de Sá Bandeira e por

Maps, Charts, &c. *Donors.*

Fernando da Costa Leal. Governador de Mossamedes. Lisboa, 1864. Scale 1 inch = 35 miles (geo.).

Same as above. Scale 1 inch = 17½ miles (geo.). On 2 sheets. Lisbon, 1863.

Karte zur Darstellung des oberen Nillandes und des östlichen Mittel-Afrika. Scale 1 inch = 56 miles (geo.). Entworfen von Carl Zimmermann. Pyritz, 1843.

Twenty-four MS. Maps of various parts of Africa, on different Scales. By James Macqueen, Esq., F.R.G.S. Miss Macqueen.

North—

Originalkarte von Dr. C. Nachtigal's Reise nach Tibesti oder Tu. Juni-September, 1869. Nach einer Handzeichnung von Dr. G. Nachtigal. Scale 1 inch = 42 miles (geo.). Von A. Petermann. Gotha, 1870. A. Petermann, Esq.

East—

Carte des Sources du Nil Blanc et de ses Affluents, pour servir et aider à l extension et au développement des opérations commerciales avec le Soudan Oriental et Équatorial. Scale 1 inch = 40 miles (geo.). Par John Manuel. Paris, 1870. .. Consul General of Egypt.

West—

A Collection of Route Maps of the Niger River, together with a few original letters from Clapperton and others. The Maps were collected from Arabs and other travellers .. .. W. D. Cooley, Esq.

South—

Adamantia. The Diamond and Gold Fields of South Africa. Scale 1 inch = 67 miles (geo.). By James Wyld. London, 1871. The Author.

Map showing the "Three Main Routes" to the South African Gold and Diamond Fields. Scale 1 inch = 60 miles (geo.). By W. B. Lord. London, 1870 .. .. The Author.

General Plan of a part of the Division of Queenstown. Scale 2½ inches = 1 mile. On 5 sheets. Surveyed by the Government Surveyor. Francis H. S. Orpen, Esq. 1870.

Map of the Territory of the Chief Nicolas Waterboer. F. H. S. Orpen, Esq.

AMERICA.

North—

Carte Lithologique des Mers de l'Amérique Nord exécutée d'après les travaux hydrographiques. Scale 1 inch = 160 miles (geo.). Par M. Delesse. Paris, 1870 .. .. The Author.

Alaska and adjoining territory, from a reconnaissance, by W. H. Dall, W. U. Tel. Expedition 1865-1868. Scale 1 inch = 77 miles (geo.). New York, 1869 .. .. W. H. Dall, Esq.

Geognostische Karte des Alleghany Systems, nach den vorhandenen Arbeiten sowie eignen Untersuchungen zusammengestellt von Herman Credner. Die Physikalische Grundlage von A. Petermann und E. Sandoz. Scale 1 inch 82½ miles (geo.). Gotha, 1871.

Geognostische Profile im Alleghany System, von H. Credner. Scale $\frac{1}{3000000}$. Gotha, 1871 . .. . A Petermann, Esq.

Central—

Carte Panoramique de l'Isthme de Darien Central (États-Unis de Colombie), publiée par la Société Internationale du Canal Colombien. D'après la Carte de M. L. de Puydt, Chef des Expéditions scienti-

Maps, Charts, &c. *Donors.*

fiques en Colombie pendant les années 1861–1865 et 1866 (3 copies). Paris, 1870 .. .. M. Lucien de Puydt.

South—

Map of Chile (incomplete), 8½ sheets only. Without title. Scale 1 inch = 3½ miles (geo.).

Distancia em Milhas geographicos dos pontos de escala dos paquetos de vapor no curso do rio Amazonas. Por 2510 milhas.

Mappa demonstrativo das distancias em leguas de 20 ao grao entre as comarcas da provincia e seus respectivos povados.

Rio Japurá em Março en April do anno del 1863. Levantado pelos Senhores Soares e Dios. Construida pelos Senhores Rodriguez e G. Caud de Martius. 1865. MS. Scale 1 inch = 5 miles (geo.).
G. W. Chandless, Esq.

Map of the River Maué-assú and its tributaries. MS. Scale 1 inch = 5 miles (geo.). By William Chandless, F.R.G.S. .. The Author.

OCEANS.

Atlantic—

Der Golfstrom im Winter (Januar) und Standpunkte der Thermometrischen Kenntniss des Nord Atlantischen Oceans und Landgebietes im Jahre 1870. Scale 1 inch = 300 miles (geo.). Von A. Petermann. Gotha, 1870 .. .. The Author.

Chart of the Southern Atlantic Ocean. Scale 1 inch = 115 miles (geo.). By Isaac Purdy. R. H. Laurie. London, 1840. Miss Macqueen.

Plan of Stanley Harbour, with Ports William and Harriett (East Falkland Island). Scale 1 inch = 9 cables. Surveyed by Capts. Fitzroy and Sulivan, R.N. 1834–39.
F. Coleman, Esq., Secretary, Falkland Islands Company.

Indian—

Madagascar—

Province of Tanibé. Scale 1 inch = 8 miles (geo.).
Plan of Foulepoint.
Plan of Ifontsy.
Plan of Vohidoity.
Plan of Tamatave.
Plan of Hivondro.
By the Rev. J. Holding, F.R.G.S. The Author.

Carte de l'île de la Réunion, (A Photograph) dressée par L. Maillard. Paris, 1861 .. .. Reverend Julius Kessler.

Pacific—

Melanesien (Oestliche Hälfte), nach den bisherigen Aufnahmen und zahlreichen handschriftlichen Mittheilungen. Von Dr. R. Grundemann. Scale 1 inch = 110 miles (geo.). Von A. Petermann. Gotha, 1870.
A. Petermann, Esq.

Rapa-Nui or Easter Island, from a survey by Lieut. John Dundas, R.N., H.M.S. *Topaze*, 1868. Scale 1 inch = 1 mile (geo.). MS.
The Author.

CHARTS.

British Admiralty—

Section 2.

No. 2182 $\frac{a}{b}$ North Sea, General Chart (2 sheets).

2281 Norway. Sheet 1. The Naze to Karno.
2330 Christiania Fiord. Norway. South Coast.

Maps, Charts, &c.

BRITISH ADMIRALTY—*continued.*

Section 3.

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Section 4.

No. 78 Ports on the North Coast of Spain,
89 River Tagus Entrance and Lisbon Harbour.

Section 5.

No. 72 Port of Huelva. Spain. South-West Coast.
175 Milazzo Bay (Sicily, North Coast).
182 Syracuse Harbour (Sicily, East Coast).
234 Port Said. Suez Canal (Mediterranean).

Section 6.

No. 232 $\frac{a}{b}$ Newfoundland. On 2 sheets.
294 Greenspond and Pools Harbour (Newfoundland).
1422 Labrador (North America, East Coast).

Section 7.

No. 2060 $\frac{a}{b}$ North Atlantic Ocean (2 sheets).

2202 $\frac{a}{b}$ South Atlantic Ocean (2 sheets).

Section 8.

No. 410 Anchorages on the North Coast of Cuba.
443 Port of Santiago de Cuba (West Indies).
2384 Anchorages on the North Coast of Cuba.

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506 Bahia de Todos os Santos (Brazil).
521 Harbours and Anchorages in Magellan Strait.
529 Pernambuco to Victoria (Brazil).
540 Bahia de Todos os Santos (Brazil).
542 Ubatuba and adjacent Anchorages.
544 Santa Catharina Islands and Strait (Brazil).
547 Harbours and Anchorages in Magellan Strait.
557 Do. do. do.
2044 Ilha Grande and Sapetiba Bays (Brazil).

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No. 23 Channels between Gulf of Trinidad and Magellan Strait (Patagonia, West Coast).
24 Channels between Gulf of Trinidad and Gulf of Peñas (Patagonia, West Coast).
110 Port Grapler and Mayne Harbour (Patagonia, West Coast).
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636 Cape of Good Hope and False Bays (Africa, South Coast).
1232 Saldanha Bay (Africa, South-West Coast).

Maps, Charts, &c. *Donors*

BRITISH ADMIRALTY—*continued.*

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748A Do. (Southern Sheet).
2413 Rhio Strait (China Sea).

Section 13.

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93 Akashi-no-Seto and its approaches (Japan).
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115 Ports of Ichang and Sha-sze (Yang-tse-Kiang).
127 Hirado-no-Seto to Simonoseki Strait (Japan).
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998 Pulo Kapas to Cape Patani (Gulf of Siam).
1115 The Upper Yang-tse-Kiang (Sheet 6).

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1017 Gabo Island to Montagu Island (Australia, East Coast).
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1068 Moreton Bay to Sandy Cape do.
1670A Moreton Bay. North Sheet do.
1670B Do. South Sheet do.
1905 Great Sandy Strait (Southern Entrance to).
2178 Anchorages on East Coast, Middle Island (New Zealand).
2493 Ports in the Gulf of St Vincent (Australia, South Coast).
2494 Lady Bay (Australia, South Coast).
2504 Portland Bay do. do.
2747A Port Phillip, Entrance (Western Sheet).
2747B Do. do. (Eastern Sheet).

Section 15.

No. 17 Santa Cruz Islands (South-West Pacific).

The HYDROGRAPHIC OFFICE, ADMIRALTY, through Capt. G. H. Richards, R.N., Hydrographer.

FRENCH GOVERNMENT—

2513 Port d'Alexandrie (Égypte) Mer Méditerranée.
2536 Carte générale de la Tasmanie.
2552 Nouvelle-Calédonie, partie comprise entre Noumea et l'île Tupeti.
2623 Carte des Rivières débouchant dans l'Estuaire de St. Jacques (1re Feuille) Basse Cochinchine.
2624 Carte des Rivières débouchant dans l'Estuaire de St. Jacques (2me Feuille) Basse Cochinchine.
2628 Carte de la Côte de Tenasserim et Archipel d'Mergui, partie comprise entre le détroit de Papura et l'île Domel (Golfe de Bengale).
2637 Mer des Antilles.
2645 Partie nord de l'île de Luçon, entrée occidentale du détroit de San Bernardino (Mer de Chine).
2646 Rivière de Wousong, entre le Yang-tzé-Kiang et Shang-hai (côte orientale de la Chine).
2654 Port d'Auckland (Nouvelle-Zélande, Ile Nord).
2655 Baie Mercury (Nouvelle-Zélande, Ile Nord, côte est).
2685 Plan du mouillage des Iles du Salut (Guyane française).
2690 Partie comprise entre le Cap des Palmes et le Cap Ste. Catherine (côte occidentale d'Afrique).
2697 Plans des Rades et Passes de l'Orient et de Port Louis.
2698 Baies Barranca et Supé (Pérou, Amerique du Sud)
2699 Plans du Port de Sandvig, et du Port de Stavanger (côte de Norvége).

Maps, Charts, &c.

2700 Baie Octavia, Port Utria, et Baie Cabita (Nouvelle-Grenade), l'Amérique du Sud.
2701 Botany Bay et Port Hacking (Australie).
2702 Baie Broken (Australie).
2703 Baie Cupica et Rivière San Juan; bouche Chirambira (Nouvelle-Grenade), l'Amérique du Sud.
2704 Angleterre, côte est de Whitby à Longstone.
2705 Plan particulière du Port de l'Assomption (Paraguay).
2706 Angleterre, côte est de la Rivière Humber à Whitby.
2707 Côte de Norvége, de Hältenö à Lekö.
2708 Côte de Norvége, de Lekö à Dönnaesö.
2709 Côte de Norvége, de Dönnaesö à Fleina et Sandhornet.
2710 Côte de Norvége, de Fleina à Ost Vaagö, comprenant les Iles Lofoten.
2711 Côte de Norvége, des Iles Lofoten à Andö.
2712 Côte de Norvége, d'Andö à Kvalö.
2713 Côte de Norvége, de Kvalö à Sorö.
2714 Côte de Norvége, de Sorö au Cap Nord, comprenant Hammerfest.
2715 Côte de Norvége, du Cap Nord à Tana Fiord.
2716 Côte de Norvége, de Tana Fiord au Cap Nametzki, comprenant Vanger Fiord.
2717 Carte Hydro-topographique des Côtes de France entre l'Ile d'Ouessant et la Pte. Penmarch.
2718 Carte Hydro-topographique des Abords du Goulet de Brest.
2719 Plan de la Baie de Nékété et de l'anse Lavaissière (Nouvelle-Calédonie).
2720 Nouvelle-Calédonie, partie comprise entre Toupeti et Kanala.
2721 Plan de la Baie Kanala et de la Côte de Bogotá (Nouvelle-Calédonie).
2722 Carte particulière des Côtes du Brésil, partie comprise entre Iguape et l'île São Sebastião.
2723 Plan du Mouillage de Mouéo (Nouvelle-Calédonie).
2724 Plan de la Baie de Fontarabie (Spain).
2725 Baie Carlisle (île de Barbade, Antilles).
2726 Port Stanley et Ports William et Harriet (I. Falkland ou Malouines).
2727 Baie Française, Berkeley Sound (I. Falkland ou Malouines).
2728 Port Fitzroy et Port Pleasant (I. Falkland ou Malouines, côte sud-est).
2729 Carte des Côtes de la Guyane; depuis Cayenne jusqu'à l'embouchure de l Amazone.
2730 Plan de la Baie de Manzanillo (Mexique).
2731 Baie d'Ak-Metchet (Mer Noire).
2732 Port de Balaklava (Crimée, Mer Noire).
2733 Rades d'Yalta et d'Ourzof (Crimée).
2734 Rade d'Aloushta (Crimée).
2735 Baie de Théodosie ou Kaffa (Crimée).
2736 Plan de la Baie de Paranagua (Brésil).
2737 Baie Huntington et Baie Oyster ou Syosset (côte est des États-Unis).
2738 Carte particulière de la Côte du Brésil, partie comprise entre Picimguaba et Tamandua (Province de São Paulo).
2739 Ile de Java. 1re Feuille. Partie occidentale depuis le Cap Indramajou et la Baie Penandjong jusqu'à Détroit de la Sonde, Détroit de la Sonde et partie Sud de Sumatra.
2740 Ile de Java. 2me Feuille. Partie centrale depuis le Cap Indramajou jusqu'au Détroit de Sourabaya; et depuis la Baie Penandjong jusqu'a l'île Sempou.
2741 Ile de Java. 3me Feuille. Partie orientale depuis le Détroit de Sourabaya et l'Ile Sempou jusqu'au Détroit de Baly, de Lombok, et d'Allas.
2742 Port Albemarle et Port Stephens (I. Falkland ou Malouines).
2743 Baie Fox et Port Edgar (I. Falkland ou Malouines).

Maps, Charts, &c.

2744 Nouvelle-Calédonie; partie comprise entre Pouébo et Arama.
2745 Côte occidentale de Corée. Plans croquis de la Rivière Han Kang ou de Séoul depuis son embouchure jusqu'à Séoul.
2746 Blackrock et Bridgeport (États-Unis).
2747 Mouillage de l'Ile Boisée et Bassin de Sierou (côte occidentale de Corée).
2748 Carte particulière de la Côte du Brésil, partie comprise entre Pernambuco et Maceio.
2749 Carte particulière de la Côte du Brésil, partie comprise entre Maceio et le Rio Tariri.
2750 Carte des attérages sud-ouest de la Rivière de Séoul (côte occidentale de Corée).
2751 Baie Wangaroa (Nouvelle-Zélande, Ile du Nord).
2752 Ports Lyttelton et Levy et Baie Pigeon (Nouvelle-Zélande, Ile du Milieu, presqu'île de Banks).
2753 Carte routière de la Côte du Brésil, partie comprise entre Ceara et Bahia.
2754 Port Egmont, Baie Keppel, etc. (I. Falkland ou Malouines).
2755 Baie Choiseul (I. Falkland ou Malouines).
2756 Rade Bull (I. Falkland ou Malouines).
2757 Côtes O. de la Patagonie des Iles Guaianeco à l'Ile Forsyth (Amérique Méridionale).
2758 Côtes du Chili du Cap San Antonio à la Baie Arauco (Amérique Méridionale).
2759 Iouanga et Gatope (Nouvelle-Calédonie).
2760 Entrée de la Rivière Connecticut (côte est des États-Unis).
2761 Porte de Plymouth (côte est des États-Unis).
2762 Plan du Mouillage de Kustenjeh (Mer Noire).
2763 Danube. Bouches de la branche Kilia et Sulina (Mer Noire).
2764 Port de Corfou (Ile de Corfou, Mer Méditerranée).
2765 Carte des Baies Sapetiba et Marambaya (Ilha Grande, 1re Feuille), Brésil.
2766 Port de Moule (côte est de la Grande-terre, Guadeloupe).
2767 Brindisi (côtes d'Italie, Mer Adriatique).
2768 Baie d'Odessa (Mer Noire).
2769 Port Nicholson (Nouvelle-Zelande, Ile du Nord).
2770 Plan de l'entrée de la Rivière Bruni (côte N. O. de Bornéo).
2771 Plan de la Rivière Bruni (côte N. O. de Bornéo).
2772 Plan du Mouillage de l'Ile Suco ou Seteï (Grande Loutchou).
2773 Seto-Uchi ou Mer Intérieure (Japon).
2774 Ports et Mouillages sur la Côte de Pérou (Feuille 4).
2775 Ports et Mouillages sur la Côte de Perou (Feuille 1).
2776 Baie St. Vladimir (côte est de Tartarie).
2777 Baie de Talien-Whan (Golfe du Pet-chely).
2778 Croquis de la Rivière Volta (côte occidentale d'Afrique).
2779 Ports et Mouillages sur la Côte de Chili (Feuille 4).
2780 Plan du Port de Malamocco et des Canaux conduisant à Venise.
2781 Carte des Iles Andaman (Golfe du Bengale).
2782 Tsau-Liang-Hai (Havre Chosan de Broughton et côte adjacente de Tchao-Sian, côte orientale de Corée).
2783 Carte de la Côte orientale de l'Ile de Célèbes.
2784 Carte des Iles Moluques; partie Nord.
2785 Carte des Iles Moluques; partie Sud et la Mer de Banda.
2786 Baie de Château (Détroit de Belle-Ile).
2787 Carte du détroit de Northumberland, comprenant l'Ile du Prince Édouard et la côte du Golfe St. Laurent de la Baie de Mirimichi à l'Ile du Cap Breton (Amérique Septentrionale).
2788 Carte des entrées de la Rivière Sarawak (côte N. O. de Borneo).
2789 Plan du Détroit de Ilo-Ilo entre l'île de Panay et l'île Mactan (Philippines).

Maps, Charts, &c. *Donors*

2790 Golfe Malampaya (côte ouest de Palawan).
2791 Port Hood (Ile de Cap Breton, Golfe de St. Laurent).
2793 Croquis de Fleuve Ogôoué (côte occidentale d'Afrique).
2794 Plan de Pur Bunder et Porte de Diu (côte de Katiwar).
2796 Carte de la Baie d'Ilha Grande (2me Feuille) Mangaratiba et Palmas (Brésil).
2797 Carte de la Baie d'Ilha Grande (3me Feuille), Angra dos Reis (Brésil).
2798 Carte particulière de la Côte du Brésil; partie comprise entre le Rio Tariri et le Morro São Paulo (Atterrages de Bahia).
2799 Nouvelle-Calédonie (4me Feuille), partie Nord.
2800 Carte de la Baie d'Ilha Grande (4me Feuille) Parati, (Brésil).
2801 Rio Grande do Sul (Brésil).
2802 Ports de Hiogo et Oosaka (Japon).
2803 Partie Nord, de Pam à Tanlé (Nouvelle-Calédonie).
2804 Nouvelle-Calédonie; partie comprise entre l'ile Tanlé et Iouanga.
2805 Plan de la Baie de Bourai (Nouvelle-Calédonie).
2806 Baie du Cap Lopez (côte occidentale d'Afrique).
2807 Côte de Suède; du Cap Falsterbo à Kalmar Sund.
2808 Côte de Suède; Kalmar Sund, île de Oland.
2809 Cote de Suède; de la pointe Nord de Oland à Landsort.
2810 Ile Gottland (Mer Baltique).
2811 Côte de Suède; de Landsort au Golfe de Bothnie.
2812 Carte de l'embouchure de Gironde.
2813 Carte du cours de la Gironde, de la pointe de Grave à Panillac.
2814 Carte des Iles à l'est de Java, de Baly à Timor.
2815 Golfe du St. Laurent; de la Rivière Tabisintac au Cap Rozier (Baie des Chaleurs).
2816 Croquis des Lagunes du Grand Bassam et d'Assinie (côte occidentale d'Afrique).
2817 Côtes ouest de la Patagonie et du Chili; de l'Ile Forsyth au Cap San Antonio.
2818 Côte N. O. de Borneo, partie comprise entre les Iles Mantanani et la Pointe Barram.
2819 Côte N. O. de Borneo, partie comprise entre la Pointe Barram et le Cap Sirik.
2820 Côte N. O. de Borneo, partie comprise entre le Cap Sirik et Tanjong Pajong (Natunas du Sud).
2821 Océan Atlantique Septentrionale des Iles Açores aux Côtes d'Europe (de Brest au Détroit de Gibraltar).
2823 Iles Scilly (Angleterre, côte ouest).
2824 Plan du Havre Eden (côte occidentale de Patagonie).
2825 Carte particulière de la Côte du Brésil, partie comprise entre le Cap Guaratiba et l'Ile São Sebastião.
2826 Plan de la Ensenada de Barragan et du Rio Santiago, dans La Plata.
2827 Embouchures de la Rivière Ponga (Afrique, côte occidentale).
2828 Grönsund (entrée de la Baltique).
2829 Rade de Punta Arena (Détroit de Magellan).
2831 Baie de Grégory (Détroit de Magellan).
2832 Plan de la Baie de l'Isthme (côte occidentale de Patagonie).
2833 Plan du Port d'Ando (Baie d'Awomori, Japon).
2834 Plan du Mouillage de Nofitsi (Baie d'Awomori, Japon).
2836 Entrée de la Baie de San Francisco (California).
2837 Ile Sado et Canal de Niegata (Japon).
2838 Plan du Port d'Hakodadi (Japon).
2839 Baie Sian-Wuhu (côte de Mantchourie).
2840 Plan du Mouillage d'Awomori. Plan de la Baie de Shiranai (Japon).
2841 Plan des Baies de Hiogo et Kobé (Japon).
2842 Baie Olga (Port Michael Seymour, côte de Mantchourie).

With 19 Books of Pilotage, 1 Almanack, and 2 Catalogues.

DÉPÔT DES CARTES ET PLANS DE LA MARINE, Paris.

MISCELLANEOUS.

Maps, Charts, &c. *Donors.*

Forty-seven Photographs of Georgian Churches, &c., in Tortoom, a district of the Old Armenian Province of Taik :—

1. Gate of Ish Khan Church.
2. Ancient Castle (called Tortoom Kalla) near Sighr, village in the Tortoom Valley, 30 miles north of Erzeroom.
3. Ish Khan Church, western side.
4. Eshk (Eochk) Vauk, entrance to Church.
5. Church of Khakho, Tortoom. Probably built by David I., forty-eighth King of Georgia, who reigned 876–881.
6. View of Eshk (Eochk) Vauk Church, Tortoom.
7. Cascade in the Tortoom Su.
   View of Ish Khan Church.
8. Scene in the Tortoom Valley.
9. View of Kalla-dibbee Village, Tortoom.
10. Window of Ish Khan Church, Tortoom.
    Western side of same Church.
11. Gate of small Church at Khakho Vauk.
    Eastern end of the same.
12. Base of Column and Patriarchal Seat at its side, in Eshk (Eochk) Convent, Tortoom District.
    Part of the Interior of Cupola in the same.
13. Two Windows of Ish Khan Church, Tortoom.
14. Window of Ish Khan Church, Tortoom.
    Zikhhik Village on the Tortoom Lake.
15. Window at Eshk (Eochk), Vauk.
    Same, showing portion of Wall, north side.
16. Khakho Church, interior, showing inscribed Column and Fresco.
    Window of the same.
17. Eastern end of Ish Khan Church, Tortoom.
    Northern side of the same.
18. Two Windows of small Church at Ish Khan, Tortoom.
19. Interior of Ish Khan Church, Tortoom.
    Gateway of small Church at Ish.
20. Scene in the Tortoom Valley.
    Eshk Vauk, large Church Doorway.
21. At Eshk (Eochk) Vauk, Tortoom.
    At the same. Commemorative Inscription in the Georgian Character.
22. Entrance to Khakho Church, Tortoom.
    View of Khakho Church.
23. View of Eshk (Eochk) Vauk.
    Sculptures round interior of above.
24. Seljook Tomb at Erzeroom.
25. Gumishlee Gumbet, Seljook Tomb, Erzeroom.
26. Tehseh Minaret at Erzeroom.
27. The Tchifteh Minaret, Erzeroom.
28. Old Minaret and Tomb in the Fort, Erzeroom.
29. Front and back View of a very curious "Feroher," found this year at Van.
30. Front and back of another and smaller specimen found at the same time and place.
    Cast of a Cuneiform Inscription.

A collection of Drawings made by Capt. J. H. Speke in Eastern Africa, 1859.

Plaster Medallion of Sir John Franklin. Diameter 17 inches. By J. S. Westmacott. 1861 .. .. Lady FRANKLIN.

A tracing in Greek Character .. .. Mrs. SCHINDLER.

INSTRUMENTS LENT TO TRAVELLERS.

To the late Mr. I. DUNCAN, Vice-Consul at Whydah, in 1849—

Telescope.
Two Compasses.
Aneroid Barometer.

Dr. P. C. SUTHERLAND, M.D., F.R.G.S., at Natal—

Brass Sextant (7½-inch), with Silver Arc, by Troughton and Simms.
Strong-framed Artificial Horizon, by Troughton and Simms.
Two Barometers (Mountain) with Improved Iron Cistern, by Newman.

The late Dr. E. I IRVING, M.D., F.R.G.S., at Abeokuta—

Pocket Chronometer, by Barraud and Lund.
Barometer (Mountain), by Troughton and Simms.

Dr. D. LIVINGSTONE, M.D., F.R.G.S., Zambesi, Eastern Africa—

Sykes's Hypsometrical Apparatus, No. 1, with Sling Case, by Casella.
Standard Thermometers, 0 to 212, in Brass Cases, "
" " in Maroon Cases, "
Artificial Horizon, with Sling Cases, "
Prismatic Azimuth Compass, silver ring, with leather Sling Case, "
Rain Gauge.

Dr. D. WALKER, M D., F R.G.S., Russian America, Dec. 8, 1862—

Sextant, 4-in. radius, by Cary.
Artificial Horizon, circular, by Cary.
Azimuth Compass, by Elliot.

The late Mons. JULES GERARD, Upper Guinea, towards Timbuktu, Feb. 4, 1863 –

Sextant, 3-inch radius, by T. Jones.
Aneroid, white metal, by Spencer, Browning, and Co.
Artificial Horizon, spirit-level, by Elliot.
Boiling-water Apparatus, and three Thermometers in brass tubes.
Azimuth Compass, by Burnier.
Two small Pocket Compasses.
Protractor, brass, 2-in. radius.
(The above in Leather Case.)
Measuring Tape, 50 feet.
Thermometer, on metal, in Morocco Case.
Protractor, horn, circular.

H. WHITELY, Esq., in South Peru, March 28, 1867—

Pocket Aneroid, No. 89, graduated to 15 inches, by Cary.
Hypsometrical Apparatus, and 3 Boiling-point Thermometers, by Casella.

Rev. F. W. HOLLAND, Sinai, June 25, 1867—

Prismatic Compass and Stand, by Cary.
Pocket Aneroid, graduated to 15 inches, "
Hypsometrical Apparatus, and 3 Thermometers, B P.
Two Thermometers, divided to 230° for hot springs.
Three Alpine minimum Thermometers.

PRESENTATION

OF THE

ROYAL AWARDS.

(At the Anniversary Meeting, May 22nd, 1871.)

ROYAL MEDALS.

The CHAIRMAN (Sir Bartle Frere) in presenting the Founder's Medal to Sir Henry Rawlinson, on behalf of Sir Roderick I. Murchison, Bart., spoke as follows:—

"I am commissioned, Sir Henry Rawlinson, by the Council and Fellows of the Royal Geographical Society, to place in your hands for presentation to Sir Roderick Murchison, the Founder's Gold Medal. If there is any difficulty in expressing the feelings of the Society on the subject, it arises solely from the intimacy of the connection subsisting since the origin of the Society, between Sir Roderick and the Institution of which he deserves the honour of a founder, and over whose destinies for forty years he has watched with more than parental solicitude; and he has at length placed the Royal Geographical Society among the foremost, the most active, the most popular, the most widely known of our scientific Societies.

"The history of Sir Roderick Murchison's connection with the Royal Geographical Society is, in fact, the history of the Society itself. His name is conspicuous among the small band of geographers, who, in 1830, formed themselves into a society for the purpose of promoting geographical science, and who were afterwards incorporated by Royal Charter. He was first placed on the Council in 1831, and was made Vice-President in 1836. He was first elected President in 1843, for the biennial term 1843-44, and repeatedly re-elected, in 1851-52 and 1857-58; and since 1862, he has, by general consent of the Society, been always re-elected, as though the Society had agreed to make him President for life: nor would

the Society now have sought to find a successor for him, had not Sir Roderick himself felt, that, after his late illness, he required more complete repose than was compatible with the constant and arduous duties devolving on the President of so large and so active a society. During the fifteen years of his tenure of the office of President, he has prepared and delivered fifteen Anniversary Addresses; each of them affording a very complete history of the progress of geographical science and discovery during the past year.

"These treatises, however, represent but a portion of his original labours as a geographer. Of the Memoirs and separate papers which he has from time to time published in various forms, and which probably exceed 150 in number, a great proportion are either purely geographical, or have more or less connection with geography. At least forty, which may be so characterised, have been published separately, with his name as the sole or principal author.

"It is a consequence of a singular union of extensive scientific knowledge, with extreme kindliness of disposition and courtesy of manner, that his aid and advice have always been freely sought by geographers and geographical students of all ages and conditions, and of every country. The most advanced master (if master there be of a science so far-reaching and comprehensive of all other sciences) felt that Sir Roderick might throw fresh light on what the philosopher already knew; the humblest student of geography soon found that Sir Roderick would gladly assist any one who sought to extend the field of geographical knowledge; and thus it came to pass that he has become the common referee of geographers and scientific travellers of our own and of all other countries.

"It is no exaggeration to say that, during the past thirty years, no geographical expedition of any consequence has been undertaken in our own, or, I believe I might say, in any other country, without some previous reference to him for advice and suggestion, often entailing laborious research and correspondence.

"Of his labours as a Geologist this is not the place to speak, except so far as they have a bearing upon geography. It is true that no man can be a great practical geographer without a more than superficial knowledge of geology; but Sir Roderick has gone far beyond what was needed as an auxiliary to his geographical pursuits, and has been distinguished among the foremost of those original explorers, thinkers, and writers, who have built up our present knowledge of geology.

"Since, at the suggestion, I believe, of Sir Humphry Davy, he first applied himself to science, soon after he retired from the army at the commencement of the great revolutionary war, he has been intimately associated with Phillips and Sedgwick, with Lyell and Buckland, and with all the great geologists of the last and present generation. It was about 1825 when he first began to be known as a writer on geology, and by 1831 he had vindicated his title to be one of our leading geological authorities and President of the Geological Society. By 1838 he had established the existence of the Silurian system, as one of the great distinctive divisions of our English geology, and had extended his investigations to France and Italy, Norway, Sweden, and Russia. Between 1840 and 1845 he was engaged on a Geological Survey of Russia, after examining the eastern parts of Germany, Poland and the Carpathians; and so highly did the Government of Russia estimate the results of his inquiries, that he received the highest honours which it was in the power of the Emperor to bestow on a foreigner, in recognition of scientific services.

"Since then, his labours in establishing the Laurentian and Permian systems, and, in conjunction with Sedgwick, the Devonian system, have added, as it were, so many provinces to the domain of geology; and since his appointment, in 1845, as Director General of the Geological Survey, in succession to Delabeche, he has taken a leading part in that branch of Practical Geology which has done so much to bring the science to its present position.

"Of the wide and far-seeing generalisations which mark the true philosopher, we have a familiar instance in the fact that, as far back as 1844, when writing on the geological structure of Russia, and comparing the auriferous regions of the Ural with Australia, he expressed a confident opinion that gold must be found in the latter country. During the next four years he repeatedly pressed his opinions on this subject, both on practical miners and on the then Minister for Colonial Affairs, though it was not till three years later that an almost accidental discovery of gold in Australia proved how true had been the philosopher's induction. This digression into the field of another science will be justified to geographers by the fact, that, there is hardly one of Sir Roderick's larger works on geology which is not also of such high geographical value as to be almost essential to anyone who would write on the physical geography of the district which was the subject of his enquiries.

"A bare enumeration of the honours which have from time to

time been conferred on him in recognition of his scientific labours would suffice to show how highly they have been esteemed both in his own country and by foreign nations.

"By his own sovereign he was knighted in 1846, made a K.C.B. in 1863, and a Baronet in 1866.

"By the Emperor of Russia he was made a Knight of the 2nd Class of St. Anne, and subsequently a Grand Cross of the same order and of that of St. Stanislaus, and a Member of the Imperial Academy of Sciences; and he has received from other European sovereigns similar honours, the last of which—the dignity of Grand Officer of the Order of the Crown of Italy—will be in the recent remembrance of the Society. But in the honours thus conferred on him, sovereigns have only confirmed the reiterated testimony of the leading men of science and scientific bodies in every part of the civilized world. In his own country, the great Universities have conferred on him the honours of D.C.L. and LL.D., and M.A. The Royal Society, the parent of all our scientific societies, many years since recognised his merits by making him F.R.S., and subsequently a Vice-President, and by granting him the Copley Gold Medal. From Edinburgh he received the Brisbane Gold Medal, and the honorary Membership of the Royal Society of Edinburgh: he is Vice-President of the Geological Society, Fellow of the Linnean Society, a Member of the Academies of St. Petersburg, Berlin, Copenhagen, Brussels, Stockholm, and Turin; a Corresponding Member of the French Institute; a Trustee of the British Museum, the Hunterian Museum, and of the British Association for the Advancement of Science, of which, as well as of our own Society, he was an original founder and has ever been an active promoter. He has received the Prix Cuvier from the French Institute, the Wollaston Medal, and other honours of the same kind, which it would be almost impossible to enumerate.

"There is one distinctive feature which we all love to recognise in our President, and to which, in his absence, I am sure you will pardon my alluding. Sir Roderick has been through life no recluse book-worm, shut up in the recesses of his own study. He has, indeed, devoted himself as eagerly to science as if scientific knowledge were his only possession and profession; but he has neglected no one social duty which was entailed on him by his position as an English gentleman of fortune, and a Scotch Laird of ample means.

"I will here mention to the Society that in a letter to Sir H. Rawlinson, which he has just placed in my hands, Sir Roderick begs

him to say that, 'Among the acts of his Presidency he was proud in having been the first President who induced the Council to deviate from old practice, in decreeing Gold Medals to two most remarkable *women*. To Mrs. Somerville as the pre-eminent geographer and physicist, and to Lady Franklin for her heroic exertions in determining the real fate of her husband.' How much the Society owes to the practical good sense which tempered all his proceedings as President, I need not remind you. The true geographer must have something of the poetical genius,—the power of creating and combining; and, like all who share such faculties, the geographer is apt to be of the *genus irritabile*. How much we are indebted to the genial nature, the unselfish love of seeing others distinguished and rewarded, which characterized our President, I need not tell those who have so long enjoyed the benefit of that harmony which has accompanied the flourishing progress of the Society while under Sir Roderick Murchison's guidance.

"These results were not accomplished without devoting, at the same time, more time and attention to the external unscientific world than any recluse philosopher could have afforded. I have always thought that there was something peculiarly English in this habit of making science a part of his everyday life, instead of a separate and exclusive profession; and in this, as well as in other respects, his career appears to me full of instruction and excellent example to that great body of educated English gentlemen, to whom the circumstances of our island life and the necessities of Foreign and Colonial Service, offer so many opportunities for advancing almost every branch of natural science.

"After devoting the nine best years of his early manhood to the military service of his country, he had every temptation to rest on his oars and enjoy life after the fashion of so many of our countrymen who have no special motive for work; but he resolutely carved out for himself a career of scientific labour in which he has steadily persevered through life, and he has now the satisfaction of seeing not only accomplished results, which alone would form a scientific reputation of the highest character, but, in the establishment of this Society, a living national institution which, we may hope, will for generations to come, continue, as active an agency in the promotion of geographical science, as it has been while it was presided over by him who watched and directed its course from its first foundation till now.

"I will now ask you, Sir Henry Rawlinson, to receive this Medal

on Sir Roderick's behalf, and to express to him the unanimous feeling of pleasure with which the Royal Geographical Society has voted him this Medal, as the only mark which it is now in their power to bestow, of the Society's sense of his great services to every branch of geographical science."

Sir HENRY RAWLINSON replied as follows:—"I am proud of having been selected on the present occasion to receive the Founder's Medal which has been awarded to Sir Roderick Murchison; proud, because I feel that the medal has never been more worthily bestowed; proud, as an old Medallist myself, to receive Sir Roderick into our brotherhood. You have so well described, Sir, the important services rendered by Sir Roderick to the cause of geography, and to this Society in particular, that I need not dwell upon the subject. It will be more appropriate to offer a few words of explanation as to how it has happened that this year's medal has been bestowed on Sir Roderick, since it must occur to the Fellows that our venerated President could have commanded such a distinction at any moment of his career as the natural reward of his geographical services. I venture to explain, then, that when Sir Roderick announced his intention to retire, owing to failing health, the first impulse of the Council was to propose some testimonial, that should hand his name down to future generations, in immediate connection with the Society over which he had so long and so ably presided. While we were deliberating, however, on the best means of carrying out this resolution, we ascertained that Sir Roderick, with a delicate and touching appreciation of the value of the Society's approbation, would prefer to any testimonial, however costly and elaborate, the simple medal which he had himself so often presented to others as the reward of merit. That Sir Roderick was amply entitled to such an award no one could for a moment doubt. Indeed, our medal may be considered to have acquired lustre from him, rather than to have conferred lustre upon him. At any rate, as an old Medallist myself, I confess to feeling an additional honour in belonging to a body which numbers Sir Roderick amongst its members, and I believe that feeling to be shared by the other Medallists whom I see around me. I will now read the letter which Sir Roderick has addressed to me in acknowledgment of the award of the medal:—

"'MY DEAR SIR HENRY,

"'In requesting you to receive for me the Founder's Gold Medal, which the Council has bestowed on me, in recognition of my long services, I beg

you to assure my Associates that this proof of their good opinion has been the greatest possible comfort to me in my present illness. This award satisfies me that the efforts which I have made for many years to promote the best interests of the Royal Geographical Society, and to advance the cause of the science which we cultivate, have been more than amply recognised.

"'I have now only to hope that by the restoration of comparative good health I may be able, if only for a short period, to perform the duties of one of your Vice-Presidents, and so continue, to the day of my death, to be as attached an associate as ever of those valued friends with whom I have passed so many happy days.'

"I think, Ladies and Gentlemen, I may venture to say that the hopes of restored health, to which Sir Roderick in this note so feelingly alludes, find a responsive echo in the breast of every individual in this great assembly. It would, indeed, be a glorious day for the Geographical Society if we could once more see Sir Roderick in the Presidential Chair, welcoming to his native land the illustrious Livingstone on his long-wished-for return from his adventurous travels. In conclusion, I take this opportunity of announcing to the Society, on behalf of the Council, that, as a further mark of our high regard for Sir Roderick, and in view to keeping his image ever before us, we have decided on obtaining the replica of a bust which has been lately executed by Mr. Weekes, R.A., and placing it in the hall of our new premises in Savile Row. As the cost will hardly exceed 100 guineas, and we are desirous of including as many as possible of Sir Roderick's friends and admirers in this offering of affectionate remembrance, we have decided to limit contributions to a guinea, and have prepared a subscription list accordingly, which now lies upon the table for signature."

The CHAIRMAN then proceeded to deliver the Victoria Medal to A. Keith Johnston, LL.D.:—

"The Patron's or Victoria Medal is presented to Mr. A. Keith Johnston for his distinguished services in the promotion of Physical Geography. An early predilection for the study of geography as a science, and a desire to accomplish something better than had yet been attempted in England, led him to give up the medical profession to which he had been trained, and to devote himself to geography as a profession. His first published maps appeared in 1830. They were the results of a walking excursion through the North of Scotland, and were issued in a traveller's guide-book.

"His first large work was the 'National Atlas,' in folio, the result of five years' labour. Most of the maps were projected and

drawn, and nearly all the names written, with his own hand. This work went through many editions, and was considered the best of its time. The writings of Ritter, Humboldt, and Berghaus on Physical Geography, and a wish expressed by Humboldt to see an English Physical Atlas constructed on a scale sufficient to show the details of physical phenomena more clearly than is possible on the scale of the German edition, determined Mr. Keith Johnston to devote his attention to physical geography.

"In 1842 he visited Germany, collecting materials, and arranging for correspondence with foreign geographers. On his return, he communicated to the Secretary of the Royal Geographical Society his plans for publishing a great English Physical Atlas. Physical Geography was at that time almost an unknown science in our English schools, so that this Atlas could not for some time prove a paying speculation; but Mr. Keith Johnston was convinced 'that a desire for such information will increase with the general diffusion of education,' and expressed to our then Secretary his willingness 'to make sacrifices in a cause to which he had long been so ardently devoted.'

"On the 21st November, 1842, the Secretary of our Society expressed 'the highest gratification' of the Council of the Royal Geographical Society at a resolve which must 'greatly contribute to the prosperity of a branch of science *totally neglected* in this country, though of the highest interest.' At first it was intended that the work should be in the main founded on the great work of Berghaus; but this intention was early abandoned, and the number of additions and improvements was from the first so great as to make Mr. Keith Johnston's Atlas essentially an original work, marking the great advances which the science of physical geography had made since the publication of the noble German Atlas.

"In May, 1845, Mr. Keith Johnston had a special interview with Humboldt in Paris on the subject of the 'Physical Atlas,' the original merits of which were explained by Karl Ritter at a meeting of the Geographical Society of Paris, in the same year, under the presidency of M. Jomard. They were again acknowledged by Ritter in his letter as President of the Geographical Society of Berlin, in forwarding the Society's Honorary Diploma. It was not until the second edition of this work was published, in 1856, that Mr. K. Johnston was able to overcome the difficulties of publishing so expensive a work, on a branch of geography previously almost unknown among us.

"The two editions cost him 10 years of the best period of his life, a large sum in the purchase of expensive foreign books, and a vast amount of labour, including correspondence, not only with the geographers already mentioned, but with Von Buch, Quetelet, Maury, and every physicist, British and foreign, who could aid him with advice or materials.

"As a result, 2500 copies of the 'Atlas' were sold, and the study of physical geography at once took its place among the necessary branches of a liberal education.

"His services to geography were recognised by the unsolicited presentation of the Fellowship of the Royal Society of Edinburgh, and of Honorary and Corresponding Fellowships of the leading Geographical Societies of Europe, India, and America. In 1865 the University of Edinburgh conferred upon him the honorary degree of Doctor of Laws, the highest honour of the kind it was in their power to bestow.

"In 1850 he published the first edition of his great 'Dictionary of Geography,'—an entirely original work, which cost him three years of incessant labour. It has gone through ten editions of 1000 copies each.

"For the International Exhibition of 1851 he constructed the first physical globe of the earth ever drawn. For this a large medal was awarded. Since 1851 he has devoted a great portion of his time to popularize the study of physical and other geography by constructing and publishing for educational purposes four atlases of general, classical, physical, and astronomical geography, besides a small elementary atlas. Of these works, from five to thirty editions have been published, of 1000 copies each.

"His medical studies in early life led him to devote a vast amount of labour to a chart of the geographical distribution of health and disease, which was completed in 1852.

"For this work the Epidemiological Society of London elected him a corresponding member, the President of that Society remarking that 'it is no false praise to say that no scholar out of the domain of medicine has ever before contributed so valuable a document to medical literature, a paper so rich in research.'

"In 1855 Mr. Keith Johnston commenced the 'Royal Atlas of Modern Geography,' devoting to it the experience gained during the labours of a quarter of a century.

"This work was *carefully watched*, and *every sheet criticised* as it came out, by the late Prince Consort, who took a lively interest in the work.

"Of the value of Mr. Keith Johnston's large Library Maps it is unnecessary to remind this Society. Of late years, he has mainly devoted himself to the preparation of maps and hand-books for educational purposes, and to cheapening the results of his previous labours so as to place them within the reach of geographical scholars of the humblest means. Of some of the lowest priced of these works as many as 30,000 copies have been sold as fast as they could be prepared; and the service thus done to education has been acknowledged by the unanimous testimony of the highest authorities on education, not only in this country, but in Canada, in the United States, in India, Australia, and New Zealand.

"It was well observed by our President, in writing to Mr. Keith Johnston in 1856, that he had well deserved the highest honours which could be bestowed for such services, for, said Sir Roderick, 'most unquestionably you have really introduced the study of physical geography to the youth of our country.'"

Mr. A. Keith Johnston replied:—

"Sir Bartle Frere, I beg to express to you, and through you to the Council and Fellows of the Royal Geographical Society, my heartfelt and grateful thanks for the distinguished honour you have just conferred on me; an honour which would be great at any time, but the value of which is greatly enhanced, in my estimation, by its being conferred on this memorable day, when geographers from every point of the compass have met to do honour to our venerated and estimable chief, Sir Roderick Murchison. You have been pleased, Sir, to allude in very kind, but far too flattering terms, to the amount of work I have been enabled to produce during a lengthened and all but uninterrupted course of labour. It is now more than half a century since my attention was first attracted to geography for its own sake, when a student of the classics at the High School of Edinburgh; and it is considerably more than forty years since I adopted it as the profession and business of my life. At the commencement of my career, I had for exemplars or contemporaries, our own indefatigable Arrowsmith in London, Berghaus in Potsdam, Kiepert in Berlin, and latterly, Petermann at Gotha. You are well aware, Sir, that work in this field must, from the nature of the case, be severe and exhaustive, to an extent unknown to those who have not engaged in it. But to me geography has truly been its own reward. Every step in the progress of physical geography appeared to me like a new revelation of the power, wisdom, and

goodness of God in creation, as revealed in the wonderful adaptation of plants, animals, and men to the several spheres they were destined to occupy on our beautiful globe. If any portion of my labour yields, in the retrospect, more satisfaction than another, it is that in which I have been enabled to do something for the introduction of physical geography into this country; and it is a source of much gratification, that I have lived to see it being adopted in our colleges and schools. I hope the day is not far distant when, encouraged by the premiums offered by our Society, it will be considered an essential branch of an enlightened and liberal English education. It would be unjust and ungrateful if I were not to allude to the aid I have at all times received from the Royal Geographical Society. The very existence of such a body, with its lofty aims and aspirations, offered a great inducement to a young man entering on a geographical career; and every President, since the time I joined the Society, has kindly offered me encouragement and tendered advice. I need not say how specially this refers to my old and tried friend Sir Roderick Murchison. I shall treasure this beautiful medal as long as life lasts, and shall hand it down to my family as an evidence that, in this great Society at least, honest, conscientious, and persevering labour will never lose its reward."

ADDRESS

TO

THE ROYAL GEOGRAPHICAL SOCIETY.

Delivered at the Anniversary Meeting on the 22nd May, 1871.

By Sir Roderick Impey Murchison, Bart., K.C.B.,
President.

Gentlemen,

When I last addressed you, at the commencement of the present Session, I was then the medium of the expression of your thanks to the Managers of the Royal Institution, for their kind consideration, by which we had been enabled to hold our meetings in their Theatre.

Now, when, through a heavy stroke of illness, I have since been unable to be among you, I beg to congratulate you on the success which has attended the appeal which I made in your name to the Chancellor and Senate of the University of London, to permit us to hold our meetings in the Grand Hall of their magnificent new edifice; and I did so because our Council had already determined, to my entire satisfaction, that the offices and map-rooms of our Society should be established in Savile-Row, in the immediate neighbourhood of the London University.

Although I have been prevented from attending any meeting in the Great Hall in which you have been assembled during the present Session, I rejoice to learn that you are admirably located therein: whilst it is most satisfactory to know that, when our adjacent new edifice is completed, there will be in it a room not only large enough to receive all our maps and illustrations, but also to contain as many members as usually frequent our ordinary evening meetings, should we in future find it necessary to avail ourselves of it.

The total number of our Fellows is still on the increase, and now

amounts to nearly 2400; and the volume of our 'Journal' for the year, thanks to the energy and assiduity of our unrivalled Editor, Mr. Bates, is already in your hands.

OBITUARY.

In such a very numerous body as our own, the usual percentage of mortality must necessarily amount to a large number; in the past year no fewer than 57 of our Associates were lost to us by death. Out of the sad list I will, in the first instance, allude to some leading men whose deaths we have to deplore.

The Earl of Clarendon, K.G.—By the decease of Lord Clarendon, on the 27th June, 1870, our country has been deprived of one of her ablest and most enlightened statesmen, who, in addition to his arduous public duties, was always a zealous promoter of geographical science and a warm friend of our Society. Born in 1800, he entered the Diplomatic Service in 1820. In 1823 he was appointed a Commissioner of Excise, and in that capacity arranged the union of the English and Irish Excise Boards (in 1826-27). In 1831 he negotiated a commercial treaty with France; and in 1832, when he was Her Majesty's Representative in Spain, he mainly assisted in bringing about the Treaty of the Quadruple Alliance. In the above-mentioned capacities he was well known as the Honourable George Villiers; and by the death of his uncle, the Earl of Clarendon, he succeeded to the title in December, 1838. As such, he was appointed Lord Privy Seal in 1840, and later in the same year he became Chancellor of the Duchy of Lancaster. In 1846 he was appointed President of the Board of Trade, and in the same year became Lord-Lieutenant of Ireland, which country he governed during a very arduous period till 1853, when he became Secretary for Foreign Affairs,—an office in which he greatly distinguished himself, and in which he signed the Treaty of Paris in 1856.

Lord Clarendon was, throughout his career, a strong advocate for Free Trade; and it is well known that it was very much through his influence the Emperor Louis Napoleon was induced to apply that doctrine, for the first time, in the government of France.

In society and private life, Lord Clarendon was generally beloved, whilst his very engaging manners rendered him justly a great favourite among foreign diplomatists. On my own part, I am proud to say that he honoured me with his personal friendship: and it was at his country seat, "The Grove," that I had opportunities of admiring the fine qualities of his heart, as shown when

in intercourse with his affectionate and devoted children, admirably brought up, as they had been, by a most accomplished mother.

WILHELM VON HAIDINGER.—Of our late Foreign associate, Wilhelm Ritter von Haidinger, it may be truly said that no single person had in his own country done more to arouse a spirit of interest and study in the various provinces of Natural Science.

Born at Vienna in 1795, Haidinger, at an early age, devoted himself to scientific labours; and for a number of years succeeding 1812 gave a special direction to his inquiries by becoming the pupil and friend of Friedrich Mohs, the distinguished mineralogist, at Gratz and Freiberg. From the year 1822 to 1827, as a worker in mineralogy, he travelled over a great part of Europe; and resided for some time at Edinburgh, where he published, in the English language, a translation of the Treatise by Mohs, in three volumes, 8vo., besides communicating to various scientific Societies and periodicals a large number of papers on special subjects.

For some years after this, he lived at Elbogen in North Bohemia, where his two brothers were conducting a porcelain manufactory, and at which place his kind and instructive hospitality to travellers will not readily be forgotten, by those who had the good fortune to stray thither from Carlsbad or the Erzgebirge. Invited by the accomplished Bohemian nobleman Fürst von Lobkovitz, who was then Minister in the Department of Mint and Mines; Haidinger, in 1840, accepted the direction of a new Museum, initiated, under Mohs, at the Imperial Mint of Vienna, with the particular object of promoting a knowledge of the mineral resources of the country. Only a few years elapsed before he was able to place so conclusively before the Austrian Government the advantages of a geological survey, that he was commissioned to organise that important national work, which, in conjunction with its museum, he continued to superintend till October, 1866. The mental activity of this amiable man—unwearied, in spite of delicate health—led him to constant exertion in the spreading of associations for the cultivation of science; and to him is, in a great measure, due the foundation of the Imperial and Royal Geographical Society of Vienna, as well as other institutions in Hungary, in Moravia, and at Milan. He deserves, too, the credit of having been mainly instrumental in paving the way for the publication of a most interesting chapter in modern geography, viz., the results of the voyage of the Austrian frigate the *Novara*. Our Society enrolled him as one of its Honorary Members in the year 1856.

Haidinger enjoyed the satisfaction of seeing a new scientific life spring up around him, and of committing the direction of his establishments to the able hands of Franz von Hauer and others of his former pupils.

Occupied to the last in scientific research, especially in all that related to meteorites, Haidinger passed the last few years of his life in comparative retirement, in his country-house at Dornbach, near Vienna, where he died on the 19th of March last.

Baron Charles Alexander von Hügel, a distinguished Austrian nobleman, and one of our Honorary Corresponding Members, died at Brussels on the 2nd of June, 1870, in the seventy-sixth year of his age. He was an eminent traveller and geographer, and had earned solid reputation for his travels in North-western India, Kashmere, China, and Australia, in the years 1835–40, concerning which he published his 'Kaschmir und das Reich der Siek;' 'Das Kabul-Becken und die Gebirge zwischen dem Hindu Kosch und dem Sutlej;' and other works. A thoughtful observer, and well-grounded in various branches of science, these records of his long journeys were an important contribution to the stock of human knowledge, and will ever be consulted by all who are occupied in scientific investigations, and particularly in the various branches of Natural History. For this distinguished service we rewarded him with our Patron's Medal at our Anniversary Meeting in 1849. His principal work, under the title of 'Travels in Kashmir and the Punjab,' was translated into English by Major Jervis, and published in 1845. After his travels he filled successively many important diplomatic posts, and at the time of his death was Austrian Minister at the Belgian Court. Personally, I was intimately acquainted with this most intelligent and agreeable man, whose reputation stood very high among Austrian politicians, Prince Metternich having been his constant friend and supporter.

Lord de Blaquiere.—By the death of Lord de Blaquiere I have lost an old friend, who zealously joined the Society under my Presidency, and I am happy to record of him that he became one of my most active supporters in the defence of ex-Governor Eyre.

Among other private friends who also joined the Society under my Presidency, I may enumerate Colonel Sotheby, son of the eminent poet, who had been for many years a constant attendant at our meetings; and Sir George Philip Lee, a most accomplished gentleman and a distinguished musician.

Sir Robert G. Colquhoun, K.C.B.—This excellent man was long

known as Consul-General in Egypt, in which capacity he was of signal service in promoting the cause of geography. He actively assisted in the succour of our distinguished countrymen, Speke and Grant, on their emerging from the heart of South Africa. He was also a warm friend of Sir Samuel and Lady Baker. On his return from his consular services he was created a K.C.B., and shortly afterwards married, as his second wife, Anne, only daughter of W. Cattrow, Esq. He died, at his paternal seat of Carnstraden, Dumbartonshire, on the 10th of December of last year. Sir Robert G. Colquhoun was very highly esteemed by all the chiefs of the Foreign Office under whom he served, and also by a very numerous circle of friends.

Sir James Clark, Bart., K.C.B., M.D., F.R.S., &c.—Few men of this age have been more beloved and respected than this eminent physician, who, through his intimacy with the Queen and Royal Family, lost no opportunity by which he could advance science. He was a distinguished chemist, and had the great merit of establishing the Royal College of Chemistry, under the auspices of His Royal Highness Prince Albert. It was through his advice that the Queen fixed upon Balmoral as her Scottish summer residence ; and so esteemed was he by Her Majesty that she assigned to him during his life the Royal demesne of Bagshot Park, where he died on the 29th June, 1870, in his eighty-fourth year.

Sir William Thomas Denison, K.C.B., one of the oldest members of our Society, was a man of remarkable energy, who, in addition to his scientific acquirements as an officer in the Royal Engineers, possessed great administrative abilities. He was the third son of the late Mr. John Denison, M.P., of Ossington Hall, Notts, and brother of the present Speaker of the House of Commons, and of the late Bishop of Salisbury. He was born on the 3rd of May, 1804, and entered the army in 1826, becoming a Colonel of his corps in 1860. He was best known, however, as Governor of one or other of our colonial possessions. His first appointment was to the Lieutenant-Governorship of Van Diemen's Land, in June, 1846, when he received the honour of knighthood. Subsequently he became Governor of New South Wales, and in 1860 received the important appointment of Governor of Madras, which post he occupied until 1866. During this time he was temporarily Governor-General of India in the interval between the death of the Earl of Elgin and the arrival of Sir John Lawrence in January, 1864. He died on the 19th of January last. On my own part, I deeply regret the death of

this most active and intelligent public servant, who was a geologist as well as a geographer. For, whether as Governor in Australia or at Madras, he never failed to make me acquainted with the Natural History features of those countries.

Major-General Sir Justin Sheil, whose death occurred, after a short illness, on the 13th of April last, had distinguished himself in the military and diplomatic services of our Indian Empire. He entered the Bengal Native Infantry in 1820, and received the medal and clasp for the siege of Bhurtpoor. In 1833 he was sent to Persia as second in command of a detachment of officers and sergeants employed to discipline the Shah's army. His service in Persia on this occasion had important results on his subsequent successful career. In 1844 he was appointed Envoy and Minister at the Court of the Shah, which post he held till October, 1854; and in 1848 he received permission to accept and wear the 1st class Order of the Lion and Sun, conferred upon him by the Shah. He was made K.C.B. in 1855, after representing British interests at the Persian Court to the great satisfaction both of his own Government and that of the Shah. Sir Justin was brother of the well-known Right Hon. Richard Lalor Sheil, Member for Dungarvan. In 1856, his accomplished and amiable wife published an account of her Persian experiences, under the title of 'Glimpses of Life and Manners in Persia.' Sir Justin became a Fellow of our Society in 1857, and served as a Member of our Council in 1861. He was a frequent attendant at our evening meetings, and was often to be seen in the Library of the Society, making use of the treasures of Geographical literature there stored for the use of the Fellows. He was one of those supporters whose loss I much deplore.

Captain Burgoyne, R.N.—The Society, as well as the Royal Navy, have to mourn the loss of a gallant member in Captain Hugh Burgoyne, who perished with a number of officers, the *élite* of their profession, and five hundred brave seamen, in H.M.S. *Captain*, on the night of the 6th September, 1870, in the Bay of Biscay.

Captain Burgoyne was the only son of that eminent soldier, Field-Marshal Sir John Burgoyne, G.C.B. Although only thirty-seven years of age, he had served since 1847 in the Navy, and in those twenty-three years had earned a repute which gave high promise of a brilliant career. Brought up in his profession by some of its best officers, he was second to none of our captains as a thorough practical seaman, with a varied experience in every quarter of the globe. He was one of the few officers in the Royal

Navy, during the Crimean War, who had an opportunity of winning the Victoria Cross for gallantry in the Sea of Azov. His marked intelligence and freedom from professional prejudice, induced the late Captain Cowper Coles, the inventor of the turret principle, to select him as the officer best qualified to test the great, but fatal, experiment put to the proof by H.M.S. *Captain*.

His untimely fate, and that of his noble shipmates, was a sacrifice to the good of their profession and country, by calling the attention of the Admiralty to the lamentable want of stability in many ships of our ironclad fleet. Although our Society may mourn his loss, yet we and his profession may justly be proud of an officer who nobly perished in the execution of his duty.

I owe this brief sketch of the lamented Hugh Burgoyne to his dear and attached comrade Capt. Sherard Osborn. Much more detailed knowledge of the deceased will eventually appear when his illustrious father can be appealed to, to speak of the qualifications of his dearly beloved only son—for as yet the venerable Field-Marshal is scarcely able to realize the irreparable loss he has sustained.

Mr. MARTIN CROFTON MORRISON, one of the best Chinese scholars of the day, and who had availed himself of his knowledge of the language and manners of the people, to collect, with great toil and at much cost and risk, a mass of information relating to the north-eastern provinces of China; was the third son of the Rev. Dr. Morrison, author of the first Chinese and English Dictionary, and translator into Chinese of the Bible, Prayer-Book, and many other works. His mother was the eldest daughter of an Irish gentleman, Martin Crofton Armstrong, of Mohil House, county Leitrim.

Mr. Morrison was born on the 4th July, 1827, and received his general education under private tutors. For a couple of years he studied Chinese with Professor Kidd at University College, London. In 1843, having been appointed to the Chinese establishment by the Government of Lord Aberdeen, he left England to join his elder brother, who, with Sir Henry Pottinger, negotiated the Treaty of Nankin, and who was, at that time, Member of Council and Chinese Secretary to the Government at Hong-Kong. Very soon after his arrival his brother died; and he was thus left, at the age of sixteen, without guide or protector. But, even as a boy, Mr. Morrison was remarkable for thorough conscientiousness and for tenacity of purpose; and he earned the entire approval of his chiefs by diligent study and exemplary

conduct. He served in the capacities of Assistant Chinese Secretary, Vice-Consul, and Consul at various ports, till ill-health compelled him to retire from the service in 1866. During that long period his explorations were mostly confined to the provinces northward of the River Yang-tsze-kiang. The chief subject of geographical interest which he witnessed and examined, long before the visit of Mr. Elias, recorded in our 'Journal,' was the extraordinary alteration in the course of the Hoang-ho, or Yellow River, which, at about 2000 miles from its mouth, was abruptly changed from the general direction of E.S.E. to N.E.—an angle of over 60°—and now runs through the province of Shan-tung and empties itself into the Gulf of Pechili, about 430 miles from its former mouth, reckoning along the coast. Another topic was the Chinese rebellion, which greatly impeded his progress and rendered travelling at times very dangerous. Although these two subjects have each their distinctive characters, yet it was Mr. Morrison's opinion that it was possible to trace where the rebellion helped to effect or accelerate the great physical change in the river.

By his premature death, in November last, Mr. Morrison was stopped in the work on which he had been engaged ever since his return home, namely, a map showing the different trade-routes between India and China, and in putting into available form the knowledge he had acquired of the geographical, geological, political, and commercial conditions of these districts; and it is to be feared that no one else is qualified fully to utilise the materials he has left behind him. According to the testimony of all who knew him, Crofton Morrison well succeeded in following the examples of the father and brother he revered; and as his modesty, perfect unselfishness, and genuine kindness of disposition gained him the affection, so did his abilities, love of justice, and blamelessness of life secure him the respect alike of Europeans and Chinese.

Captain C. D. Cameron.—Captain Cameron, under the name of Consul Cameron, was well known to the public as the unlucky prisoner of King Theodore, and one of the causes of the costly but brilliant Abyssinian war. Previous to his appointment as British Consul at Massowah he was known chiefly as having served with distinction in the Kaffir War, and as having been a member of the staff of Sir W. Fenwick Williams, when that gallant officer was engaged in organizing the defences of the Turks in Kurdistan and

Armenia, during the Crimean War. He was then given the local rank of captain in Turkey, and was placed by his chief in superintendence of the fortifications which were being erected in Erzerum. After the war he served as Vice-Consul at Redout Kalé and at Poti, and was appointed Consul at Massowah in 1860, commencing his duties at that place in January, 1862. He became a member of our Society in 1858, but did not contribute to our Geographical publications in any way. He died on the 30th of May last.

THOMAS BRASSEY, M.P., the successful Railway Contractor, had been a Fellow of our Society since the year 1860. By the surveys performed under his orders for the many railways he undertook to construct in the Colonies and in foreign countries, he may be said to have been a contributor to the common stock of Geographical knowledge. He was born in 1805 at Boughton, in Cheshire, and died on the 8th of December last, at St. Leonard's, whither he had resorted for the benefit of his health. As a writer in the 'Times,' to whom I am indebted for these details, observes, a fair idea of the magnitude of Mr. Brassey's operations may be gathered from the fact that in the thirteen years, from 1848 to 1861 inclusive, he made, either directly or in association with others, 2374 miles of railway, at a contract price of nearly twenty-eight millions of pounds sterling. While his activity, intelligence, and probity in carrying out these great enterprises, secured for him, towards the end of his career, a colossal fortune, he was throughout life esteemed for his benevolence and generosity. Many of his foreign undertakings, especially the flying railway over Mont Cenis, proved, in a pecuniary point of view, disastrous speculations to him; but such was the large view he took of everything upon which he was engaged, and such his steadiness of purpose and integrity, that although ample cause was given him to get rid of such bargains through failure of periodical payments, he always insisted upon carrying out his engagements to the letter.

Among other deceased members, though not men of science, many have been noted in other walks of life. These are:—Sir Edmund Antrobus, the respected partner in the house of Coutts and Co., General Akrell, Rev. C. D. Brereton, Mr. James Barrett, Captain Thomas Birch, Mr. J. O. Balfour, Mr. H. Blackett, Mr. J. C. C. Bell, Mr. H. Blanchard, Mr. D. Chambers, Mr. C. H. Dickson, Mr. W. F. de Gex, Mr. J. W. Dover, Mr. F. A. Goodenough,

Admiral Robert Gordon, Mr. J. Gibson, Mr. J. A. Hessey, Mr. J. Henderson, Rev. Sir H. J. Ingilby, Mr. F. F. Jeyes, Mr. R. W. Kennard, Sir J. Kirkland, Mr. R. Low, Dr. J. L. Learmouth, Mr. J. Mackillop, Mr. J. McEwan, Mr. J. Phillips, Admiral M. Quin, Colonel G. W. Raikes, Mr. G. R. Smith, Mr. G. Smith, Mr. J. S. Smith, Mr. O. H. Smith, Colonel Sir A. C. Sterling, K.C.B., distinguished on the staff of Field-Marshal Lord Clyde, Mr. H. Thorold, Rev. W. H. Walker, Mr. A. E. Way, Mr. A. Walker, Sir H. E. Young, Lieut.-Colonel M. W. Gladdish, Mr. W. H. Blaaw, and Major-General F. H. Robe, C.B.

Admiralty Surveys.*

The following is a brief outline of the Hydrographical operations which have been carried out, under the Admiralty, on home and foreign coasts during the past year.

Upon the east coast of England, Staff-Captain Calver and his three assistants, in H.M.S. *Porcupine*, were engaged, during the early part of the season, at the head of the Lynn Deeps, in furtherance of a complete re-survey of that extensive estuary known as the Wash, wherein many important changes had occurred since it was examined by the late Captain Hewett, R.N., upwards of forty years since.

During the middle and latter part of the summer the *Porcupine* resumed her interesting occupation of the previous year in the scientific investigation of the deep sea. The objects proposed on this occasion were a survey, physical and zoological, of the Atlantic slope along the coasts of Spain and Portugal, of the Strait of Gibraltar, and along the shores of the Mediterranean as far as Malta. The results, so far as the examinations extended, were eminently satisfactory; many interesting observations were made on the temperatures at various depths, and much new light thrown on the systems of ocean circulation and the connexion between the currents of the Mediterranean and the Atlantic Ocean.

Some very valuable observations were especially made, both of the surface and under-currents in the Strait of Gibraltar by Dr. Carpenter, aided by the practical skill and ready resource of Captain Calver, with the view of settling this important problem: but, over so wide a field of research, it is obvious that much

* Communicated by Rear-Admiral G. H. Richards, F.R.S., Hydrographer.

must still remain to be done before any fixed and satisfactory laws can be laid down and finally recognised; and for this we must hope for future investigations. It may be mentioned, in connexion with submarine currents in this region, that the Falmouth and Gibraltar cable, which was laid in June, 1870, and which failed to work a few months since, was found, when recovered, to have been chafed, in several places, as fine as a knife-edge, which, by those engaged in its recovery, is attributed to the action of a considerable current over a rocky, uneven bottom: this opinion, however, is as yet by no means clearly demonstrated. The fracture in the cable occurred in a depth of 500 fathoms of water, 100 miles westward of the Strait of Gibraltar, and about 60 miles south of the River Guadiana, where the surface current is not considerable.

For a full and scientific account of these researches, the reader is referred to the narrative drawn up by Dr. Carpenter and Mr. Gwyn Jeffreys, published in the 'Proceedings of the Royal Society,' No. 125, Vol. xix.

H.M.S. *Lightning*, under Staff-Commander John Richards, whose services are devoted to the western shores of England and the coasts of Ireland, was specially diverted from this service, during the early part of 1870, for the purpose of minutely surveying a section of the Strait of Dover, between the South Foreland and Cape Grisnez, with a view to possible engineering operations. The survey was carried out by running continuous lines of soundings from the neighbourhood of the Foreland to within 3 miles of the French coast.

Along the three central lines of this section, soundings were obtained about 400 feet apart, the bottom being probed at each cast (by a machine, constructed for the purpose, weighing 7 cwts.) to an average depth of 8 inches, and specimens of the soil brought up. It may be interesting to state further that, on the oozy bank off Dover, the probing machine penetrated to a depth of nearly 5 feet, while in the offing 14 inches was the greatest depth reached, of which 6 inches consisted of drifting substances, such as gravel, sand, stones, &c., overlying 8 inches of chalk, the upper part of the latter, generally soft, hardening with the descent. Numerous fine specimens of chalk, of various colours, were obtained. But frequently the machine would not penetrate at all, and in some cases, where the attempts were repeated, the lower part of the probe was repeatedly broken and destroyed by contact with the hard bottom. The substrata of bottom of the Channel, from the Foreland across

to near Cape Grisnez, was found to consist entirely of chalk, but varying much in density as well as in colour; white and grey prevailing near the Foreland and in mid-channel, and brown as Cape Grisnez was approached. Veins of soft chalk, resembling pipeclay and varying in colour according to situation, were occasionally met with; but the general character of the ground was hard and very uneven, especially from mid-channel towards the French coast, where the great strength of the tidal stream appeared to have swept away drifting substances, and even to have hollowed out the soft veins of chalk, leaving only the hard ridges between.

The result of this survey seems to prove, from the unevenness of the ground and the strength of the current, unfavourable to a scheme which has been proposed of connecting this country with France by an iron tubular subway, though not unfavourable to a tunnel.

During the latter part of the season the *Lightning*, under Staff-Commanders Richards and W. B. Calver, was occupied in making a new survey of the estuary of the River Dee and its approaches, which were found to have much changed since the survey of 1859.

The Survey of Portsmouth and its neighbourhood has been conducted by Staff-Commander D. Hall, with a steam launch and a small party. During the past season a minute measurement has been made of the depths on the Bar of Portsmouth Harbour, an operation which it is highly necessary to make periodically, in order that timely measures may be taken to maintain the channel at a depth of 20 feet, or nearly so, at low water.

These successive examinations have shown that the deepening of the entrance to our greatest Naval depôt, from 13 feet to 20 feet, which was effected by dredging between the years 1858 and 1863, has proved a great success: nevertheless, some further dredging operations are required, principally to carry out conditions not strictly fulfilled on the occasions referred to.

Now that the bed of the Channel appears to have attained a state of rest, it is most desirable that these operations should not be delayed.

Commander Hall has also resurveyed the Medina River on a large scale, with the view to deepening certain parts of the channel by dredging: and plans on 30 inches to a mile have been constructed of the upper portions of Portsmouth and Langston harbours, showing the connecting channel facing Hilsea lines, which has been excavated for the passage of gunboats.

Tidal diagrams have also been constructed, with the view of

showing the probable effect which would be produced on the bar of Portsmouth by connecting the tidal waters of the two harbours.

Mediterranean and Red Sea.—Captain Nares and the officers of H.M.S. *Newport* have been employed during the last summer in prosecuting the survey of the coasts of Sicily and the coral-banks between it and the coast of Tunis; a suitable deep-water channel was descried south of the Skerki reef, through which the telegraph-cables connecting Gibraltar and Malta, and the latter with Bona, have been successfully laid.

In consequence of the increased traffic through the Red Sea since the construction of the Suez Canal, a resurvey of the Gulf of Suez became necessary, and the *Newport* was detached from the Mediterranean on this service in September, since which time the survey has been vigorously prosecuted in the face of many difficulties: considerable progress has already been made, and the ship is about to return, until the cool season again sets in, when she will be replaced by a vessel more suited to cope with the weather and the climate of the Red Sea.

In compliance with a request from the Indian Government that a resurvey should be made of the port of Aden, previous to the dredging operations about to be undertaken for increasing its capabilities, Navigating-Lieutenant Ellis was sent from England in October to carry out this service, which has been satisfactorily completed.

West Indies.—Navigating-Lieutenant George Stanley has succeeded Staff-Commander Parsons in the conduct of this survey, and has been employed during the past season, with one assistant, in extending the survey of Demerara, which was commenced in September, 1869.

The approaches to the Rivers Demerara and Essequibo, with the adjacent coast, having been completed, the surveyors have lately been employed in obtaining off-shore soundings on the extensive bank which fronts British Guyana, an operation of a very arduous and tedious character, in the small sailing-vessel at their disposal.

Newfoundland.—This survey is conducted by Staff-Commander J. H. Kerr, aided by two assistants, and is carried on during the summer season in a small hired steam vessel. A portion of the last season was devoted to sounding the eastern approach to Belle Isle Strait, when the limit of the 100-fathom edge of the bank was well defined, in the interest of the line of passenger-vessels which run between Liverpool and Quebec, and adopt this route during a part

of the year. The fogs which are so prevalent on this dangerous coast, and which, in addition to the presence of ice, enhance the difficulties of navigation, give an increased value to these soundings as a guide to the mariner: with the same view, depths have been obtained on the hitherto blank spaces in the charts of the Gulf of St. Lawrence. During the latter part of the season, the surveyors were engaged in defining and charting the numerous dangers in the neighbourhood of Bonavista Bay, on the eastern coast of Newfoundland.

In the depth of winter, Commander Kerr and his assistants aided in several attempts to recover the broken Atlantic cable, but, owing to a constant succession of storms, intense cold, and the prevalence of ice, their efforts were unsuccessful.

British Columbia.—Staff-Commander Pender and his two assistants have been employed, during the past season, in examining the rugged western seaboard of the islands which front the coast of British Columbia, northward of Vancouver Island; this service has been completed, as well as the inner and sheltered ship-channels of communication, as far as the northern boundary of the colony, in 54° 40′ N. lat. Additional soundings have also been obtained on the bar at the entrance of the Goletas Channel, at the north end of Vancouver Island, and resurveys, on a large scale, of Becher and Pedder bays, at the eastern end of St. Juan de Fuca Strait. This survey may now be considered complete, and sufficient to meet all the requirements of the navigator and the settler for many years to come, and the party have been consequently withdrawn.

Cape of Good Hope.—During the past year this survey, under the conduct of Navigating-Lieutenant Archdeacon, has made excellent progress: the coast has been completed from Lambert Bay, northward, to a few miles beyond the Orange River, a distance of about 250 miles, although, from the want of a vessel, it has not yet been possible to complete the soundings off it.

Great hopes were entertained that the entrance to the Orange River would have proved navigable, thus opening up a new and shorter route to the lately-discovered diamond fields: such hopes, however, were not realised, the entrance having been found obstructed by an extensive sandbar, and the river within, for several miles, a mass of sandbanks.

A survey, however, of Port Nolloth, about 50 miles to the southward, has been executed. It is a small, but very safe harbour for vessels of light draught, and is becoming of considerable importance

to the colony as a port of shipment for the copper-ore obtained from the mines which are situated about 90 miles from the coast. "Great credit," Mr. Archdeacon remarks, "is due to the Copper-mining Company for the energetic manner in which they are carrying out works for developing the mineral wealth of this otherwise unproductive tract of country: a steam tramway is in course of construction from the port to the mines, 40 miles of which were completed and in working order at the end of December."

This surveying party has undergone considerable hardships and privations, consequent on the scarcity and extreme saltness of the water, and the almost entire absence of inhabitants in the vicinity of the coast, where the country is little better than a barren sandy waste.

South Australia.—During the early months of 1870, Navigating-Lieutenant Howard and his assistant were employed in a small colonial schooner in sounding the neighbourhood of Tipara Reef in Spencer Gulf, and examining the Northern Coast of Kangaroo Island, between Point Marsden and Cape Borda, a distance of over 50 miles.

Subsequently the coast was surveyed from the mouth of the Murray River to Cape Jaffa, 40 miles south of Lacepede Bay. Mr. Howard remarks of this bay that, although quite open to the westward, it is remarkable as a perfectly smooth anchorage; the swell from the Southern Ocean being entirely broken up and dissipated by the time it reaches within a mile of the beach, in four fathoms of water, even in the most violent gales. This circumstance he attributes to the very gentle undulation of the bottom, and the consequent gradual shoaling of the water from about 10 miles off-shore up to the beach.

Later in the season the coast line was completed from Cape Jaffa to Glenelg River, making altogether a distance of about 230 miles of coast examined during the year: the greater part of this, owing to the impossibility of effecting a landing from boats, was carried out by shore parties, and the off-shore soundings still remain to be completed: on this work the surveyors are at present employed.

Victoria, Australia.—Navigating-Lieutenant H. I. Stanley, aided by two assistants, has completed the line of coast known as the Ninety Mile Beach, Gipps' Land, and carried the survey eastward to Cape Everard, a point about 40 miles from Cape Howe, the eastern limit of the colony. The greater part of this stretch of coast is uninhabited; and, as a landing could not be effected with safety, it

became necessary to carry on the survey by walking parties, crossing the rivers on rafts constructed of drift timber. In this manner, and in the face of many difficulties and privations, among them the absence of fresh provisions, 120 miles of coast were surveyed in less than three months, and conspicuous beacons erected for fixing the positions of the soundings still to be obtained. In addition to the above, large-scale plans have been made of Port Fairy and Warrnambool Harbour.

The coast has been closely sounded, from Wilson Promontory to near Merriman Creek, on the Ninety Mile Beach, amounting in measurement to about 400 square miles. The total amount of coast surveyed by this party during the year has been 180 miles, the greater part of which was open and exposed.

New South Wales.—It was noticed in the last annual report, that the seaboard of this colony, together with the off-shore soundings, had been completed; the charts of the whole coast have since been published, and reflect the highest credit on all the officers who have been engaged in this excellent survey. Navigating-Lieutenant Gowlland, who, in succession to Captain Sidney (the officer who commenced and conducted the survey for several years), has brought it to a close, has been retained for a time in the colony by permission of the Admiralty, for the purpose of completing the inner waters, and has lately finished the survey of Clarence River.

Queensland.—Staff-Commander Bedwell, who is in charge of this survey, has, with one assistant, in a small colonial vessel, carefully examined and surveyed the shores of the colony, from the northern part of Hervey Bay almost to Port Curtis, a distance of about 140 miles; and this stretch of coast has been closely sounded to a distance of twenty-five miles off-shore.

Eastern Archipelago.—Under this designation are included the Sulu Sea and the channels among the Philippine Islands leading eastward into the Pacific Ocean—the passages southward into the Sea of Celebes, the Moluccas—and Banda and Arafura seas towards Australia. It must be acknowledged that the term is sufficiently comprehensive, and the information which we possess regarding it as a navigable region is at present extremely imperfect. Looking to the prospect of an extensive commercial intercourse springing up between China, Japan, and the Australian colonies by these routes, the work has scarcely been commenced too soon.

H.M.S. *Nassau*, under the command of Commander W. Chimmo, was fitted out last year, and left England in May to commence this

great work. The ship passed through the Suez Canal and Red Sea, making an examination there, of various sites proposed for light-houses; she then carried a line of deep-sea soundings, in depths varying from 2000 to 3000 fathoms, between Galle Harbour in Ceylon and Java Head at the entrance of Sunda Strait, and thence up the China Sea to Hong-Kong, for submarine-cable purposes, finally leaving Hong-Kong for the scene of her work early in December; by the last accounts she had commenced her labours in the Sulu Sea.

Japan.—Commander St. John and the officers of H.M.S. *Sylvia* have been principally employed during the past year in making surveys of the intricate portions of the Inland Sea of Japan, which were most urgently required. They have completed the passages on either side of the "Conqueror" Bank, from Cone Island on the east to Mutsu Sima on the west, a distance of about 20 miles; and when this very important part of the navigation of what is now rapidly becoming a great thoroughfare, is published, it cannot fail to be a great boon to the seamen of all nations, and the navigation of the Inland Sea, throughout its whole length, about 250 miles, will then be an operation of comparative ease and safety.

The ports of Matoya and Owasi, on the south coast of Nipon, have also been surveyed, and will prove valuable as harbours of refuge, for vessels caught in bad weather between the eastern entrance of the Inland Sea and the Gulf of Yedo.

Commander St. John has furnished some valuable observations on the great Japan Current, and on the Typhoons, which prevail in this region, and acknowledges the valuable assistance which has been rendered to him in these researches by the intelligent Commanders of the Peninsular and Oriental Company's ships, running between China and Yokohama. It is gratifying to relate, in connexion with this survey, the very great interest which has been manifested in the work by the Government of Japan: everywhere the greatest possible attention and civility have been extended to the surveying parties, and assistance in the way of guides, interpreters, &c., freely afforded.

At the request of their Government, some young Japanese officers were received on board the *Sylvia*, and instructed in the art of nautical surveying and the use of instruments; acquitting themselves very creditably. A small steam vessel has also been placed at the disposal of Commander St. John, for the purpose of co-operating in the survey; and it seems not improbable that at no distant

time the Japanese may take up the Nautical Survey of their own coasts, or at any rate materially contribute towards its completion.

In closing these brief notices of the progress of the Surveys of the Eastern Seas, which it has been the policy of this country to pursue ever since our commercial relations with China were seriously established subsequent to the war of 1841, it is impossible not to reflect on the vast benefits which accrue, in consequence, to the commercial interests of all nations, but especially to our own, and at an expense to the country of very little more than the ordinary annual cost of two of the smallest class of vessels of war.

Summary.—The usual Tide Tables, lists of Lights, Hydrographic Notices, and Warnings to Mariners, have been issued during the past year. Of Sailing Directions there have been published a volume for the West Coast of England, from Milford Haven to the Mull of Galloway; revisions of the Channel Pilot, relating to the North Coast of France and the Channel Islands, and also of the Persian Gulf Directory. New directions have likewise been prepared for the navigation of Magellan Strait and the northern channels; the result of the late survey.

Forty new charts have been engraved and published, and over one thousand added to or corrected. Among the former may be noticed, as of especial importance to navigators, a new series of the North and South Atlantic Oceans in four sheets, and of the Indian Ocean in two sheets, on scales coinciding with the Pacific series previously in circulation; an entirely new series for the Strait of Magellan, embracing from Cape Virgin, on the east, to Cape Pillar and the Gulf of Peñas on the west and north: these latter charts, on good navigable scales, are principally the results of the labours of the late Admiralty Survey under Capt. Mayne, C.B.; they amount to seven sheets, exclusive of numerous separate plans of anchorages; and there is no reason now why the largest steamers, with the assistance of these charts and directions, should not avail themselves of the smooth-water route, and enter the Pacific from the Gulf of Peñas in the latitude of 47° S.

Lastly, it must not be omitted to notice a new Magnetic Variation Chart of the World, just published from materials collected at the Admiralty since 1858, the date of the last chart of the kind. Owing to extended magnetic observations in various parts of the world, and to the changing character of the element which this chart represents, it is important that it should be renewed at certain intervals of years. The present publication, under the superin-

tendence of Staff-Captain F. J. Evans, has been compiled by Navigating Lieut. Creak, of the Hydrographic Department.

The number of Admiralty Charts printed for the use of Her Majesty's ships and the public generally, during the last year, has been one hundred and fifty-three thousand.

New Publications.—*Colonel H. Yule's edition of 'Marco Polo.'*—Whilst these pages are passing through the press, I have received an early copy of a work—a new edition of 'Marco Polo'—which, by the profound erudition it displays on all topics relating to the mediæval geography of Central and Eastern Asia, merits prominent notice in an Address like the present. Colonel Yule, indeed, by his previous work, 'Cathay, and the Way Thither,' noticed in my Address of 1867,* had shown himself thoroughly competent for the great work which he has now, after many years' labour, brought to a conclusion.

The maps, 17 in number, with which the two handsome volumes —in addition to 90 pictorial engravings—are illustrated, give a geographical character to the book at the first glance. Six of these maps are devoted to the elucidation of the itineraries of Marco Polo, and one is intended to embody his own conception of the geography of his route, being constructed, as far as possible, on his own corrected data and expressions. Among the others is a Plan of modern Pekin and its environs, overlaid by another showing the city as it stood about the year 1290, when described by Marco Polo under the name of Cambeluc; besides plans of Hangchow, the Traveller's "Great City of Kinsay," with its lake; the remains of the Great Mongol City of Sarai, on the Volga; and so forth. The pictorial illustrations, also, are well selected, and often convey vivid ideas of the places and subjects described by the mediæval Traveller. Such is the one representing the Paizah, or Honorary Golden Tablets of the Mongols, to which Marco Polo so often alludes; and such also is the restoration of the ancient city of Pagán, in Burma, the *Mien* of the quaint Venetian Traveller, as compiled from Colonel Yule's own sketches on the spot. The carefully-studied illustrations of the Mongol camps of the Middle Ages, of the Chinese fleets, and of the Mediterranean galleys of the same period, as well as the representations of the aborigines of Western China, after Chinese drawings, are all of

* 'Journal,' vol. 37, p. cxxxi.

the same instructive character. In short, the reader will derive no little aid, in enabling him to realise the full meaning of the mediæval Traveller's descriptions and narrative, from the copious illustrations which enrich this remarkable book.

With regard to the Editor's part in the work itself, it may be observed that the Preliminary Discourse on the Life and Book of Marco Polo introduces a variety of documents from the Venetian Archives, of which some, such as the great Traveller's will, have not been before published in England, and others are entirely new. Among the latter may be noted the record of a case before the Venetian Court of Requests, in which Marco Polo prosecutes an unfaithful agent, who had been entrusted by him with the sale of a parcel of musk, the first document known in which Marco appears as an actual trader. The different texts of the Traveller's book, their sources, mutual relations, and comparative value, are made the subject of a discussion, which is illustrated by Tables, showing the filiation of the different manuscripts, as deduced by Colonel Yule; and a list of the known MSS., amounting in number to 75. It may be added, as a striking proof of the amount of original research made by Colonel Yule, that this number exceeds by nearly 30 the fullest list hitherto compiled; and that 27 of the whole number have been actually examined by him.

A task such as the elucidation of the many obscure points in the narrative of Marco Polo could not, as the Editor modestly observes in his Preface, have been satisfactorily accomplished by the resources of any one person. The force of this remark will be evident, when it is considered that not only a knowledge of the written language, history, and archæology of China and other countries of Asia is absolutely necessary, but an acquaintance with various recondite branches of science, and personal acquaintance with the topography of portions of the vast countries over which Marco Polo's travels extended. The sagacity and industry of Colonel Yule have, however, served him well in seeking and obtaining valuable aid from many authorities on special subjects. Among many others to whom he acknowledges his indebtedness, may be named the Cavaliere Guglielmo Berchet, of Venice; Dr. William Lockhart, formerly Resident in Pekin; one of our medallists of last year, Lieutenant Francis Garnier; Major Montgomerie, of the Indian Trigonometrical Survey; the Rev. Dr. Caldwell, author of the 'Dravidian Comparative Grammar;' Mr. A. Wylie, of Shanghai, the eminent Sinologist; the Rev. H. A. Jaeschke, of the Moravian

Mission in British Tibet; Pundit Manphul, C.B.I., lately British Agent in Badakhshan; Colonel Lewis Pelly, H.M. Resident on the Persian Gulf; Professor Schiefner, of the Imperial Academy of St. Petersburg; Sir Arthur Phayre; Sir Bartle Frere; and Professor Vámbéry.

Among the new geographical elucidations contained in the work, some of which are, to the great convenience of the reader, pointed out in the Preface, are the following:—The explanation of the name *Gheluchelan*, applied by Polo to the Caspian (I. p. 55); a detailed discussion, with a map, of the route between Kerman and Hormuz; and the identification, for the first time (by the aid of Colonel Pelly), of the site of the older Hormuz, on the mainland (I. p. 104–108); the identification of Polo's *Cobinan* with the still-subsisting district of *Koh-Benán*, in northern Kerman (I. p. 117); the establishment, by the aid of Pundit Manphul, of the position and continued existence of Keshm, in Badakhshan, the *Casem* of Polo, a place which had disappeared from modern geography (I. p. 147); the identification, by the aid of Dr. Caldwell, of the site and ruins of the great port of *Cail*, in Tinnevelly (II. p. 307); and many others of similar interest and importance.

Italy.—A remarkable revival of interest in Geographical enterprise has of late been displayed in Italy, the birth-place of so many renowned travellers and discoverers. The Italian Geographical Society, to which I have alluded in former Addresses, as presided over by the energetic Chevalier Cristoforo Negri, now comprises no fewer than 1254 members, as I learn from the Anniversary Address of the President, delivered at Florence on the 30th of April last. This Address, occupying fifty-five pages of large octavo size, is a comprehensive review of the progress of Geographical science and discovery during the year, and shows how closely its learned author has followed the achievements of travellers and the records of Geographical research in all countries. It is apparent from Signor Negri's observations that he is anxious to secure the co-operation of all those distinguished Italians who are engaged in exploration, under foreign Governments, and the results of whose labours have hitherto been published in other languages than their own. By gathering these within the fold of the Society of their mother country, great results may in future be anticipated. Even at present, the *Bollettino* of the Society, issued in annual volumes, contains many valuable original memoirs and maps, which all geographers will do

well to consult. During the past year the Society has received the Reports of Nachtigal's Expedition to the Sultan of Bornou, to which an Italian gentleman, Signor Valperga, is attached. The expedition intended to return by the dangerous route of Waday, where the unfortunate Vogel was murdered.

Switzerland.—From our indefatigable Corresponding Member, M. J. M. Ziegler, of Winterthur, we have received the usual annual Report of the progress made in perfecting the topography, geology, and climatology of Switzerland. By this we learn that the Geodetical Board have continued their operations since the last Report, and that Professor Hirsch has announced that the determinations of longitude will be concluded during the present year. We also learn that the Federal Government, in addition to the superb maps of Switzerland they had previously given to the world—the work of the Federal Ordnance Survey—have issued a new set of contoured maps of portions of the country, namely, the environs of Berne and of Interlachen, on scales of 1 : 25,000 and 1 : 50,000. The Surveys of Switzerland, supported by the Federal Government, tend gradually to render the knowledge of the topography and physical geography of this diversified portion of Europe as complete as possible. Thus, a cadastral survey of all the 132 municipalities of the Canton of Soleure is now in course of execution, under the direction of M. H. Denzler, on a scale of 1 : 500 and 1 : 1000.

United States.—The American Geographical and Statistical Society of New York, which is destined, no doubt, to play an important part in the promotion of Geographical science, numbered, in the early part of the present year, 540 members. At the annual meeting, on the 20th of February last, an interesting general report on the geographical work of the United States for the past ten years was read by Professor Gilman, under the form of the annual Address to the Society. In this comprehensive discourse, the numerous Expeditions which have been organized to survey the vast Western Territories of the States were briefly passed in review. The scientific results of some of these, published with rare completeness and at liberal outlay by the United States Government, are well known in England; others, such as the publications of the Geological Survey of California, are much less known, although of the highest general and scientific interest. This Survey, chiefly under the direction of Whitney, has examined the range of the Sierra Nevada of California, measuring its lofty peaks

and mapping out on a large scale the many picturesque valleys lying along their flanks. We now learn that a map is nearly ready for publication, giving the results of these surveys, as far as regards the central part of the State, in which the highest peaks of the country are situated. But more than this, a series of elaborate volumes is in course of preparation (three of which are already issued), devoted to the Geology, Physical Geography, Botany, and Zoology of California. When we consider that the cost of all this is defrayed by the State Government, and voted by the State Congress, we cannot but admire the enlightened public spirit thus displayed by the citizens of the "Golden State;" and our admiration is increased on learning that some portions of the country, especially those picturesque tracts where groves of the gigantic cedars are still growing, have been reserved by the State, in perpetuity, as vast parks for the enjoyment of the people.

Besides the noble work just mentioned, there are enumerated in Professor Gilman's discourse, among recent operations, the official survey of the country adjacent to the 40th parallel, under Mr. Clarence King, which includes an accurate topographical examination of a belt adjacent to the Central Pacific Railroad, with researches in its geology, botany, and so forth; and the surveys, by different parties, viz., Parry and Engelmann, Gilpin, and Whitney and Brewer, of the peaks and so-called parks of Colorado Territory, comprising the central part of the Rocky Mountain system. An account is given also of a party sent by the Harvard Mining School, by whom a survey has been made of the loftiest portion of Colorado, the results of which have not yet been published. It has now been established that the three highest peaks in United States territory are Mount Whitney in California, and Mounts Harvard and Yale in Colorado, none much exceeding 15,000 feet above the sea-level. Other surveys have been—that of Arizona, by Mr. J. T. Gardner, the Utah Boundary Survey, Major Williamson's measurement of the depression below the sea-surface of Death's Valley, in the southern part of the Great Basin, and particularly the remarkable examination of the Great Cañon of the Colorado River, made by Major Powell during a courageous journey through this stupendous chasm. The interest excited by these surveys is creating in the States a demand for a national topographical and trigonometrical survey, similar to those of many European countries, which assuredly will not be much longer delayed.

It is scarcely necessary in this place to point out the great im-

portance of these works to all engaged in geographical pursuits. The Cartographer, indeed, both in the United States and in Europe, will readily adopt the great mass of new information supplied by these surveys, and register them on new maps for public use; but the Physical Geographer should not be unmindful of the great addition to the illustrations of his science which these explorations in the western parts of North America are calculated to furnish, undertaken, as they have been, over a portion of the world in a high degree remarkable for the variety and singularity of its physical configuration.

India.—A Memoir on the Indian Surveys, by Mr. Clements R. Markham, has been printed by order of the Secretary of State for India, which is intended to furnish a history of the scientific surveys from their first commencement. The narrative is supplied with numerous references, in order to enable an inquirer to follow up his researches on any special point, or on any particular branch of the subject. It is thus a work the perusal of which will give a comprehensive idea of the measures that have been taken in India for the advancement of geography and kindred sciences, while it is also intended to be permanently useful as a book of reference. The Memoir is divided into seventeen sections. The first gives a history of the marine surveys conducted by officers of the Indian Navy, and is an interesting record of operations which have added very largely to our geographical knowledge. I need only refer, in proof of this, to the numerous important papers in our 'Journals,' and in those of the Bombay Geographical Society, by officers of the Indian Navy; all of which are noticed in this section of Mr. Markham's Memoir. The first surveys on land were not commenced until Lord Clive had won the battle of Plassy; when that great geographer Major Rennell commenced his honourable career by mapping the districts of Bengal and Behar. The second Section of the Memoir contains an account of the route-surveys of Rennell and his coadjutors in various parts of India. In the commencement of the present century, the system of route-surveying was superseded by the more scientific trigonometrical method introduced by Colonel Lambton. The eight following Sections of the Memoir contain a narrative of the labours of Lambton, Everest, Waugh, Thuillier and Walker, and of the distinguished officers who have served under them. This ground is covered by the measurement of the great Indian arc of a meridian, commenced by

Lambton, and successfully completed by Everest; by the operations of the Great Trigonometrical Survey, and by the work of the Topographical and Revenue Surveys. Here we have a record of work conducted with great scientific knowledge, with marvellous skill and judgment, and with untiring zeal; through which results have been obtained that are unsurpassed, for magnitude and importance, in any other part of the world. Hitherto the history of these most interesting operations has been buried in official reports, which are not easily accessible; and a complete general view of them, in a convenient form, such as is supplied by these sections of Mr. Markham's Memoir, cannot fail to be welcome to all geographers. In his 12th Section, Mr. Markham gives some account of the method of supplying instruments for the use of the scientific surveys in India, and of the observatory established at Lambeth, under the direction of Colonel Strange, for testing and examining them.

The subsequent Sections of the Memoir review the operations of the scientific labourers in those other branches of inquiry, which are included under the head of Geography in its most comprehensive sense. The 13th Section gives a history of the Geological Survey of India, as well as some account of the earlier labours of zealous independent inquirers before a systematic survey was established. Then follows a section on Archæological Researches in India, containing a general view of the work of James Prinsep, Wilson, Cunningham, Fergusson, Meadows Taylor, Walter Elliot, and other eminent men who have laboured in this important field of inquiry. A perusal of the Archæological Section of the Memoir will furnish very striking evidence of the close connexion between geography and the investigations of the archæologist. The identification of sites of ancient cities, and a comparison of their present position with the positions described in ancient writings, supplies proofs of physical changes, especially as regards the courses of rivers. Indeed comparative geography, which is not the least important branch of our science, is wholly dependent on the labours of archæologists. The next Section gives a detailed account of the meteorological and tidal observations that have been undertaken, from time to time, in various parts of India; of the valuable contributions to our knowledge of Indian meteorology by Colonel Sykes, General Boileau, Dr. Buist, Mr. Allan Broun, and others, and of the systematic arrangements for meteorological registration which have recently been adopted by the Indian Government. In his 16th Section, Mr. Markham records the labours of astro-

nomers in India. First touching upon the ancient studies of Ulugh Beg, and the later observations of the renowned Jye Sing, a sketch is then given of the work accomplished by the English successors of those Oriental astronomers, at the Madras Observatory, under Goldingham, Taylor, Jacob, and Pogson; and at Trivanderum under Caldecott and Allan Broun.

The 17th Section is devoted to physical geography, and to an attempt to supply information respecting the efforts that have been made to form generalizations from the observations collected by surveyors and other inquirers. Mr. Markham here enumerates the opinions which have been formed by geographers respecting the physical structure of the great Himalayan mass, the views entertained with reference to the river-systems, and the accounts that have been published of the physical features of other parts of India. He also gives an account of the labours of botanists, and supplies references to works on forest conservancy, and other results of human action, which have so important a bearing on the physical changes of the earth's surface.

Mr. Markham devotes a final Section to a history of the utilization of the work of the surveyors, and of the preparation and publication of maps, from the time of Richard Hakluyt, the first cosmographer to the East India Company. He reviews the labours of Rennell, Dalrymple, Horsburgh, Aaron Arrowsmith, and John Walker; and gives information respecting the preparation of the Indian Atlas, of the charts of Indian seas, and of other maps and memoirs. Mr. Markham is now himself in charge of the Geographical Department of the India Office; and it is a source of great satisfaction to find that care is at last being bestowed on the priceless collection of geographical documents which have been inherited from the old East India Company. The importance of having a Department in England, in communication with the surveyors and other scientific inquirers in India, has long been felt; and it is certainly a cause for congratulation among geographers that an arrangement should have been made which, while ensuring the efficient transaction of business connected with the Indian surveys, will also have the effect of securing a more general diffusion of knowledge in England respecting the noble and zealous labours of our brother geographers in the East.

The operations of the Surveys in India, during the last season, 1869-70, show steady progress, and have resulted in the production of a large number of useful maps, and of considerable additions to

geographical knowledge. Mr. Markham's memoir will enable geographers to refer to the previous history of operations now in progress; and, in reviewing the work of the Indian Surveys during the last season, I will therefore take them in the same order as has been adopted in the sections of his memoir.

Indian Marine Surveys.—Since the abolition of the Indian Navy, in 1862, no fresh marine surveys have been undertaken. This is the more to be deplored, as a great deal of very important work remained unfinished, while the surveys of many parts of the Indian coasts urgently require periodical revision. Mr. Markham has recently brought this subject to the notice of the Secretary of State for India; and I am glad to learn, from a statement made by Mr. Grant Duff, in the House of Commons, that its consideration has been referred to our Associate, Governor-General the Earl of Mayo.

The Great Trigonometrical Survey.—This great work, under the superintendence of Colonel Walker, is now approaching completion. Five trigonometrical Series are still in hand. The Brahmaputra Series, on the 90th meridian, under Captain Thuillier, has been pushed forward 56 miles during the last season. It follows the course of the Jamoona branch of the Brahmaputra, passing through a flat country, much cut up by watercourses. The operations of the Burmah Series, under Mr. Rossenrode, were, unfortunately, brought to a sudden stop, owing to the financial panic of last year. The Beder Longitudinal Series is to connect the Great Arc with the Coast Series. It passes through a most difficult and pestiferous region, chiefly in the basin of the Godavery. The work was undertaken by Sir George Everest, when quite a young man, nearly fifty years ago; but he and his whole party were struck down by malignant fever, and they were obliged to abandon the attempt. The country has scarcely been visited since, and has never been mapped. It is densely wooded, and thirty-two hill-tops had to be cleared of forest for observing-stations. Mr. Shelverton, who was in charge of this Series, during the season of 1869-70, carried the triangulation over 70 miles, and extended the preliminary work for 170 miles further. But he, like Everest, was struck down by fever, with most of his party, and five of his men died. Having partially recovered, Mr. Shelverton nobly stuck to his work, with that devoted zeal which has ever distinguished the members of the Indian Surveys; and the melancholy news has now arrived that he has died at his post, a true martyr to science. He had been many years in the Survey, and had done much valuable

service, which has been fully acknowledged in the reports of his chiefs. He was an admirable surveyor, and a man of undaunted courage and zeal. His loss will be much felt. The Belaspur Series, on the meridian of 82°, has been commenced by Mr. Keelan, and was extended for 95 miles during the last season. The Bangalore Meridian Series is intended to cover the ground of Colonel Lambton's original work, from Cape Comorin to the Beder base, which, in consequence of improved instruments and the more accurate methods of modern times, now requires revision. The Series is divided into two Sections, under Lieut. Rogers and Major Branfill.

The topographical surveys, under the superintendence of Colonel Walker, include those of Kumaon and British Gurhwal, Kattiwar, and Guzerat. The first, directed by Major Montgomerie, shows a very large out-turn of work; while that officer's highly interesting report on the journey of the Mirza—the native whom he instructed and selected for the extensive journey over countries unvisited by Europeans since the days of Marco Polo and Benedict Goes—is fully noticed in my narrative of the progress of discovery in Central Asia. I must not omit, however, to mention here the work of Captain Carter, in fixing the positions of many peaks in the mountainous country north of Peshawur. The Kattiwar Survey, under the thoughtful and judicious supervision of Lieut. Trotter, has made good progress, and a large area on the western shore of the Gulf of Cambay is completed. The Survey of Guzerat, under Major Nasmyth, was commenced during the season of 1869-70.

Two astronomical parties, on the meridians of 75° and 80°, have been at work, under Captains Heaviside and Herschel. The former took sets of observations at five stations between the parallels of Indore and Poona; while the latter took sets of observations at two groups, consisting of three stations each,—one near Bangalore, and the other at Coimbatore. The results, at several stations of a group, serve to show whether there is any essential local deflection. Such was found in both groups. Lieut. Herschel used the zenith-sector, recently completed by Messrs. Troughton and Simms, from designs by Colonel Strange, on which he reports very favourably.

The levelling operations of the Survey, conducted by Mr. Lane, covered a circuit of 570 miles in Oude and the North-West Provinces, during the past season, and the discrepancy at closing only amounted to 0·14 of a foot.

In the season of 1868-69 Major Basevi completed his series of pendulum observations on the great meridional arc of India. In 1869-70 he took observations on points on the coast, in nearly the same latitudes as the pendulum stations inland. He selected positions far from mountain ranges, that the results might not be affected by such variations of gravity as are met with in the vicinity of high land. A series of observations was also taken on the Island of Minicoy; and Major Basevi intends to observe on the elevated plateaux of Ladak and Tibet, at Aden and in Egypt on his way home, and to bring the work to a close by a series taken at Greenwich. His observations of last season were calculated to throw some light on the relative variations of gravity at continental, coast, and ocean stations. The results show that gravity on the coast is greater than inland, and at ocean stations greater than on the coast.

At the computing office of the Great Trigonometrical Survey, Mr. Hennessey and Mr. Cole have re-determined the thermal expansion of the standard bar, by very careful and exact investigations, which entailed much labour. An accurate knowledge of the factor of expansion of the standard bar, was the one thing wanting to permit the final reductions of the base lines, and these reductions have now been completed. Colonel Walker has thus been enabled to commence the publication of the final results of the Survey; and his first volume has just appeared. It contains a very interesting introductory account of the early operations of the Survey from 1800 to 1830, and the details of operations connected with the base lines and the standard of measurement. The whole work, consisting of some twenty volumes, will form a complete history of the Great Trigonometrical Survey of India.

The Revenue Surveys of India, divided into the Upper and Lower Circles, have been actively prosecuted; and 21,054 square miles have been surveyed during the season of 1869-70. The Upper Circle comprises two parties in the North-West Provinces, one in Oude, two in the Punjab, one in Sind, and four in the Central Provinces. The Peshawur Survey, embracing 2467 square miles, under Colonel Johnstone, was commenced in 1863. Much valuable work has been done beyond the frontier, and several errors have been discovered in the old maps, especially one in the course of the Cabul River. Colonel Johnstone made friends with the wild hill-tribes, a race of plunderers, like our own Borderers three centuries ago. One of the Afreedees chanced to see the Colonel's crest—*the winged spur*—and, on asking its meaning, he was told the well-

known Border story, which rejoiced his heart. Henceforth there was a fellow-feeling for the Sahib whose Border ancestors had the same pursuits as the Afreedees. In Nemar, the maps of the surveyors were of great use to the railway engineers in their preliminary operations. They were saved the necessity of making surveys of their own, which expedited their work materially. The Lower Circle comprises surveying parties in Nowgong, Luckimpore, Hooghly, Cooch Behar, Hazareebagh, and Seebsaugor. The work of the Madras Revenue Survey is also progressing, and the village and district maps form the basis for the future construction of useful maps on smaller scales.

The Topographical Surveys of India are undertaken to furnish all the details required for good military maps, and for engineering and other administrative purposes, in Native States, or in the hilly and thinly-populated regions where elaborate field-surveys are unnecessary. India is too large and diversified to be dealt with by one system of survey only; and Colonel Thuillier, who has now been in charge of the Revenue and Topographical Surveys for upwards of a quarter of a century, has pushed forward two systems side by side, each admirably adapted for the special requirements of the region to which it is applied. During the season of 1869-70 seven topographical surveying parties have been at work in Gwalior and Central India, the Central Provinces, Chota Nagpore, Ganjam, Bundelcund, Rajpootana, and the Cossyah and Garrow hills. All these regions were previously either unmapped or represented only by very old imperfect sketches. They are for the most part wild and extremely unhealthy, and labour is procured with much difficulty. The total work includes 16,315 square miles surveyed, and 13,218 of advanced skeleton triangulation; and much material has thus been furnished for several of the unfinished atlas sheets. In the Central Provinces, the party commanded by Mr. Girdlestone was at work in the loftiest and wildest parts of the Satpoora range, and in the malarious forests near the Wyngunga valley. The party had been employed for sixteen years in this wild region, and had mapped 26,580 square miles. Colonel Saxton's party was employed in finishing the Saora hills, within the Ganjam Agency, which are inhabited by tribes who had never before allowed strangers to enter their country. The party under Lieutenant Sale, in Chota Nagpore, explored the extremely interesting region which forms the water-parting between the valleys of the Sone and Nerbudda. Lieutenant Sale himself suffered from an attack of malarious fever. The survey

of the Cossyah and Garrow hills, which had hitherto been conducted by our associate Major Godwin Austen, was, after his departure on leave, entrusted to Captain A. B. Melville, the news of whose melancholy death has just been received.

Colonel Thuillier is year by year increasing the usefulness of his office, by the issue of excellent compiled maps, and by the rapid preparation of maps of the recently surveyed districts. In the last year no less than 24,558 maps were issued to government officials and local agents from the Surveyor-General's Office at Calcutta. In the photographic branch Colonel Thuillier is ably and zealously assisted by Lieutenant Waterhouse, and 60,116 copies of photo-zincographed maps were struck off during the year. But the great achievement of the season has been the publication of two quarter-sheets of the Indian Atlas. In 1868 it was resolved that this work should be completed in India; and Colonel Thuillier made the necessary arrangements, and took skilled engravers out to Calcutta with him, on his return early in 1869. Mr. Coard is the superintendent of the engravers. The sheets now published at Calcutta are No. 87 S.W., which includes Lucknow, and No. 125 S.E., being a part of Sylhet. They will lose nothing by comparison with the engraved sheets produced in England. Mr. Coard has also devoted much of his time to training native engravers; and the young apprentices have made rapid progress in writing, and even in the more difficult process of hill etching. The advantages of engraving the sheets on the spot, where there can be immediate reference to the surveyors themselves and to the original documents, are sufficiently evident; and we may look forward to very excellent results from the remaining sheets of the atlas being prepared and engraved under the able supervision of Colonel Thuillier himself.

The Geological Survey of India.—The intrepid geologists, who are doing such excellent service under the leadership of Dr. Oldham, have visited many wild unexplored regions in India, and their valuable memoirs and reports have added very largely to our geographical knowledge. During the season of 1869-70, Mr. H. B. Medlicott has revised the geological maps of the Jhansi and Saugor districts, Mr. Ball revised the maps of the Rajmehal hills, Mr. Hacket explored the Jubbulpore country, and Mr. Ormsby, after completing a revision of a large portion of the Bhaugalpore district, added one more to the long list of men of science who have fallen victims to the Indian climate. Mr. Mallet reported on the geological structure of Aden, with a view to determining whether the

principle of Artesian wells could be applied there with any prospect of success. In Madras, Mr. Foote has been engaged in geologically mapping the valley of the Upper Kistna, to determine, on the one side, the outline of the great Deccan trap-rocks, which have overflowed all the other formations, and, on the other, to fix the boundary of the immense area of fundamental gneissic rocks. Mr. Blanford, who did such good service in Abyssinia, has been engaged in examining the coal-fields of Bilashur and the Nerbudda valley, and a valuable lead-vein at Chicholi, near Raipur. Mr. Hughes has explored the great coal-field of the Wurda valley, and has shown much judgment and skill in selecting localities for boring, while Mr. Fedden was mapping the area covered by trap-rocks, to fix their boundaries in the vicinity of the coal-measures. The operations of these zealous geologists have been recorded in memoirs, which also contain so much important geographical information that they call for special notice here. I am glad to find, from Dr. Oldham's last Report, that materials are now complete for the publication of several final geological maps.

The Archæological Survey of India. — Systematic archæological investigations, under the supervision of General Cunningham, who only left England last December, will commence in the ensuing season; and all previous work of this kind is noticed in the section of Mr. Markham's memoir which is devoted to this subject. But I cannot omit a notice of General Cunningham's first volume of his 'Ancient Geography of India,'—a very important work, which embodies some of the results of his previous antiquarian researches. In this volume, General Cunningham follows the routes of Alexander the Great, and of the Chinese pilgrim Huen Thsang; identifying the sites of several important cities and sacred spots. These identifications illustrate the changes that have taken place in the courses of the Punjab rivers, and of the Indus, and the extraordinary alteration of the whole region between the Sutlej and the Jumna. The work is a most valuable contribution to our knowledge of the ancient geography of India, and shows the great importance of archæological investigations, in the study of the physical changes that have taken place on the earth's surface.

Meteorological and Tidal Observations in India.—Within the last three years, the Indian governments have established a more systematic method of meteorological registration, under the superintendence of special reporters. A regular series of careful observations has been taken at the Surveyor-General's Office at Calcutta,

and others at the Madras Observatory, and at Bombay, for a long course of years; and an order has existed for many years enjoining the registration of the thermometer and rain-gauge at civil stations and hospitals. But since 1867 all work of this kind has been placed under special reporters, whose duty it is to inspect the various stations, reduce the observations, and submit annual reports on the climatology of their provinces. Mr. Blanford is the meteorological reporter to the Bengal Government; and he has worked very zealously to establish numerous efficient stations, and to utilise the observations that are thus accumulated. Dr. Murray Thompson and Dr. Neil occupy the same positions in the North-West Provinces and the Punjab; and the observations in Madras are superintended by Mr. Pogson, the astronomer. In future years, we may fairly anticipate valuable results from the systematic labours of the meteorological reporters, which will throw light on questions connected with the monsoons, and other special features of Indian meteorology. Tidal observations have, notwithstanding the urgent representations of Dr. Whewell, been hitherto much neglected in India. But Mr. Parkes, the consulting engineer of the Kurrachee Harbour Works, has recently investigated the phenomena of Indian tides with ability and success, and has published useful tide-tables, based on good series of observations, both for Kurrachee and Bombay. It is to be hoped that similar observations will be made at other points on the coast of India.

I cannot conclude this brief review of the work of surveyors and other scientific observers in India, without noticing the greatly increased facilities for obtaining maps and other official publications connected with geography, which have resulted from the establishment of a Geographical Department at the India Office, so ably directed, as it is, by our senior Secretary, Mr. Clements Markham, who has brought together all the knowledge above mentioned. Formerly the sheets of the atlas were the only official maps that were accessible to the general public. Now all maps published by the Surveyor-General at Calcutta are supplied at once by the agents appointed by the India Office; while a very complete catalogue prepared by Mr. Trelawney Saunders, the Assistant Geographer, enables the engineer to see at a glance the extent of the country of which the maps are already on sale, with their size and scales. Mr. Saunders has also prepared, by order of the Under Secretary of State for India, two small but elaborate maps of the mountains and river-basins of India. In these maps the Himalaya

mountains, especially, are distinctly delineated in a new form, the great chain of peaks being represented as a culminating outer range, separated by a series of elevated valleys from an inner range, which form the water-parting between the basins of the Ganges and Sanpu. The relation of the Himalaya to the Karakorum mountains, the Gang-dis-ri, and the lofty plateau of Tibet, is also defined; and the Kuen-lun is represented as the northern escarpment of the Tibetan plateau descending to the depressed plains of Gobi. In general, the orography of this little-known region of highlands has been so distinctly defined by Mr. Saunders, as to invite further critical attention to the subject.

Asia.—*Central Asia.*—I announced to you at the opening of the Session the irreparable loss which the Society had sustained in the death of that enterprising and accomplished explorer, Mr. Hayward, who it was once hoped would have solved the great problem of Central Asian Geography by traversing the Pamír Plateau from the frontier of India to the Russian possessions on the Jaxartes. A very full and interesting account of all the circumstances connected with the foul murder of this promising traveller was contained in a letter, which was written to myself by the agent, Mr. Frederick Drew, who was sent to investigate the matter on the spot, and which has since been read at one of our evening meetings and published in the 'Proceedings' of the Society; and I am now enabled to state that further intelligence has been received by the Government of India, from an independent source, which confirms the main points of Mr. Drew's Report, and shows that in the country itself, and among the hillsmen acquainted with the details of the actual outrage, no suspicion is entertained of the complicity of the Cashmere Maharaja or his officers. There are some grounds, however, for believing that the murderer, Mir Wulli, of Yassín, did act at the instigation—or at any rate with the full consent—of the powerful Chitrál Chief, Aman-i-Moolk, whose jealousy was aroused by the intrusion of a European traveller into the mountains; and if any measures, therefore, of retribution are ultimately decided on, it is probable that Chitrál will be held equally responsible with Yassín. In the mean time the Maharaja of Cashmere has undertaken to erect a monument to Mr. Hayward's memory in the Gilgit Valley, and a suitable inscription has been sent out from England to be engraved upon the tomb. A few books and papers were recovered from Mr. Hayward's effects, and are expected shortly to arrive in England;

but it is not likely that they will contain any geographical information beyond that already presented to the Society, as Mr. Hayward had only proceeded two stages in advance of his former station at the head of the Yassín Valley when overtaken by the assassins whom Mir Wulli had sent upon his track. The present whereabouts of the murderer are not positively known, but it is believed that he has taken refuge with the famous Akhoond of Swát, at a short distance from our Peshawur frontier; and his identification, at any rate, is rendered easy by a limping gait, which is likely to be permanent, as he sustained a compound fracture of the leg from the kick of a horse during his recent wanderings, and the bone has never properly united.

But although our hopes of obtaining through Mr. Hayward's energy and skill a complete map of the hydrography of the Pamír lands have been thus disappointed, considerable progress has been made through other means in clearing up doubts regarding the physical features of that interesting region. One of Major Montgomerie's native explorers, who rejoices in the pseudonym of "the Mirza," and who has proved himself to be a worthy companion-traveller to the celebrated Pundits, has lately executed a very remarkable survey of the southern portion of the Pamír Plateau. Following in the footsteps of our early medallist, Lieutenant Wood, from the Afghan frontier to the junction of the two arms of the Upper Oxus at Kila Punja—with some unimportant variations in the route along the river of Badakhshán—the Mirza succeeded, under the most trying circumstances, owing to the severity of the winter season, in tracing up the southern arm of the river to one of its sources in an alpine lake, named Pamír Kúl or Berkut-Yassín; and having thence crossed the watershed into the river-system of Yarkand, he visited the little-known city of Tash-kurgán, and subsequently proceeded by an entirely new route to Yangi-Hissar and Kashgar. The Mirza cannot claim a complete priority of discovery in his delineation of the route from Kila Punja to Tash-kurgán, for another native traveller, Mohammed Amín, had already followed the same track and published his itinerary in Mr. Davies's Report on the North-western boundary of India; and a similar route, indeed, had been supplied to Macartney when he attempted, sixty years ago, to map this region about the sources of the Oxus; but Major Montgomerie's *employé* has, at any rate, the credit of being the first explorer who has taken an astronomical observation at Tash-kurgán since the time of the Jesuits, or who has furnished

any trustworthy data of the geography of South-Eastern Pamír suited to the scientific requirements of the present day. The remarks, indeed, of Major Montgomerie on the line of watershed from Ladak to Kokan,—as well as on the physical features of those great mountain-chains which invariably exhibit their culminating peaks on transverse spurs in advance of the watershed, and on the correct determination of the longitudes of Kashgar and Yarkand, all of which are based upon materials supplied by the Mirza,—must be of the highest interest to Geographers, and merit the warmest acknowledgments of this Society. The Mirza's achievements are summarized by Major Montgomerie in the following pregnant sentences:—"This total route-survey extends to 2179 miles, about 350 miles of this ground being entirely new. The heights of 28 different points have been determined by boiling-point observations, and 48 observations for latitude have been taken at 14 of the principal stations on the route."

In my last Anniversary Address I informed you that Mr. Douglas Forsyth, accompanied by that observant and accomplished traveller Mr. Shaw, had proceeded on a mission from the Viceroy of India to the Court of the Atalik Ghazi at Kashgar. This mission, owing to accidental circumstances, has not perhaps achieved the full geographical results that might have been expected from it, but neither has it been infructuous. Although, indeed, owing to the Atalik Ghazi's absence on a warlike expedition against the Tunganis on his eastern frontier, Mr. Forsyth was unable to proceed beyond the city of Yarkand, yet, in that limited field of operations, he obtained valuable results from the labours of his subordinates. In the first place, by detaching a confidential agent from Cashmere to rejoin him, by a circuitous route, in the plains of Turkistan, he succeeded in obtaining a report of the road across the mountains, by the Darkote Pass, where Mr. Hayward was murdered, and from that point, through Tash-kurgán to Yarkand; while, on his return journey, he further utilized the services of Mr. Shaw, as I shall presently explain, in the exploration of a considerable portion of unsurveyed ground between the Karakorum and Kuen-lun. Mr. Shaw is stated in Mr. Forsyth's Report to have used his instruments carefully and continuously throughout the route, and his register of observations, which has recently reached us, has proved of the greatest value in setting at rest the long-contested question as to the longitude of Yarkand. Major Montgomerie, from a careful comparison of the Mirza's route with all previously existing

materials, had been led to assign to the city in question a longitude of 77° 30′; and this would have been accepted by geographers as a certain position had not Mr. Forsyth stated, apparently on Mr. Shaw's authority, that the true longitude was 76°. This alarming discrepancy of a degree and a half of longitude, which threatened to throw the whole map of Turkistan out of gear, has been now removed, by the calculation of Mr. Shaw's lunar observations by a computer at Greenwich,—a mean result of 77° being obtained for the position of the city of Yarkand.

The only extension of geographical discovery which has been announced to us, on the part of the Russians in Central Asia, since our last Anniversary Meeting, has resulted from Col. Abramoff's expedition of last summer to the sources of the Zarafshan. In this expedition, the Russian troops crossed, on four different occasions, the snowy mountains, a prolongation of the Thiān-shan, which intervene between the valleys of the Jaxartes and the river of Samarcand; and found the passes to be from 15,000 to 16,000 feet above the level of the sea. Colonel Abramoff also carefully examined the two parallel valleys of the Macha and Yagnān, which run down from the western face of Pamír, and supply the head-waters of the Zarafshan. He found the Macha River to issue from a glacier which entirely blocked up the defile, and was reported to be 35 miles in length—the head of the glacier extending indeed to the eastward of the longitude of Kokan; while the sources of the Yagnān (to which, however, he did not penetrate) were reported to reach almost to an equal distance.

From these discoveries, it follows that the sources of the Zarafshan will have to be transferred about 100 miles to the eastward of the Fān Lake, where, in the maps recently published, the river has been held to take its rise. Colonel Abramoff further ascended the pass to the south of the Fān Lake, and stood upon the water-shed between the Zarafshan and the Oxus, looking over the rugged country which is drained by the Hissar and Kafir-nihan streams flowing to the southward. On his return to Samarcand, operations in the Keshtub and Maghian valleys, which furnish tributaries running north to the Zarafshan, likewise enabled the Russian commander to gain a tolerable knowledge of these hitherto unvisited localities; and the exploration of the Samarcand district, together with the adjoining territory of Shahr-i-subz, may thus be considered to be now pretty well accomplished.

I am informed by Sir Henry Rawlinson that the geography

of the upper valley of the Zarafshan, and particularly of the Fân Lake and the Macha defile, admits of ample illustration from the Memoirs of the Emperor Baber, who frequently traversed these regions during the troubles through which he struggled to power. Most of the names, indeed, which have been recently brought to light by the Russian surveys are to be found in Baber, though hitherto not recognisable, owing to the faulty readings of the Turki manuscripts. Sir Henry will give ample explanations on this subject in his 'Monograph on the Oxus,' which will be printed in the next volume of the Society's 'Journal.'

Finally, it will interest geographers to learn that the Topographical Department of the Russian Government have quite recently completed a new map of their province of Turkistan, which will naturally contain all the new data gathered by the expeditions I have mentioned. It is to include also Western Siberia, and I trust we may be furnished with a copy, by the courtesy of the Russian authorities, to whom we are indebted for similar donations on former occasions.

In continuation of the observations I have already made regarding the Expedition of Mr. Forsyth, it gives me the highest satisfaction to mention, that I have very recently received a long and instructive letter from our distinguished associate Mr. R. B. Shaw, the companion of Mr. Forsyth, descriptive of his journey across the mountainous region southwards and eastwards of the Karakorum Pass, to explore which he was detached from the rest of the party on returning from Yarkand. The letter is accompanied by a sketch-map of the Upper Valley of the Shayok, showing the line of watershed of this part of Central Asia. Besides determining correctly, by astronomical observations, the position and altitude of many spots hitherto unvisited, Mr. Shaw has delighted me, as a geologist, above all, by stating that he has determined the dip and direction of all the strata in this hitherto unexplored region; and has even collected many fossil shells, which, when sent home, will enable us to affix a precise age to the different rocks he has examined. His description of the difficulties which he and his followers experienced in traversing the deep defiles which lead from the western limit of the Tibetan plateau, and the rugged country of snow-clad peaks, vertical precipices and chasms, which extends from that point to the westward, is, indeed, most striking; and I have no doubt that, when this communication and map are

printed, they will form one of the most interesting and important parts of the volumes of our Society. The western edge of the great plateau is here edged by a huge wall of limestone mountains, placed like the *revêtement* of some gigantic embankment; and to this, in the opinion of Mr. Shaw, is due the preservation of the level uplands from the excavating action of rain and snow. For the clouds which drift up the Shayok Valley towards this lofty limestone chain are arrested by that phalanx of mighty peaks, and expend all their powers on its gradual destruction. The difficulties experienced by Mr. Shaw, in endeavouring to descend towards the old Karakorum road, are a sufficient commentary on this view of the physical structure of the region; his party being baffled in their attempts to penetrate the narrow water-worn gorges, where the naked limbs of his coolies were lacerated by the broken ice of the torrents, over whose beds they were compelled to march. This portion of the journey has furnished a real addition to the geography of Central Asia, of which the interest is enhanced by the varied powers of observation of this accomplished traveller.

Manchuria.—I learn through our Associate, Mr. Delmar Morgan, that an Expedition last summer, through Manchuria, under the auspices of the Imperial Russian Geographical Society, has accomplished results considered highly satisfactory to the executive of that important Body. The Expedition was entrusted to the command of the Archimandrite Palladius, and started from Pekin on the 13th of April, 1870, traversing the whole of Manchuria from south to north, *viâ* Moukden, Kirin, Petuna, Tsitsihar, Mergen and Aigun; a remarkable journey of nearly a thousand miles through one of the least known parts of Asia. Steaming down the Amur, Palladius next ascended the Ussuri to Lake Khinka, and, crossing the portage, arrived at the Russian port of Vladivostok on the shores of the Pacific. Being an Archæologist and Ethnologist, as well as a Geographer, and well acquainted with the Chinese language, Palladius devoted much of his attention to the study of the native tribes of Manchuria, their language, and the architectural traces of ancient civilisation. He has opened up, therefore, a new line of investigation, relating to the original seats and migrations of the old tribes which have had so powerful an influence on Chinese development. Ethnologists, as well as Geographers, will do well to consult the detailed account of that Expedition, which will, doubtless, be published in the Bulletin of the Russian Geographical Society.

In the western part of Mongolia, also, I learn, through a letter of Baron Osten-Sacken to Mr. Bates, a remarkable journey has recently been performed by Dr. Radlof, who visited the town of Kobdo in that little-known region. The narrative of this journey is to form part of one of the volumes published by the Russian Geographical Society. Another journey in the same country is that of M. Pavlinof, who travelled over the previously unvisited route from Kobdo to Uliassutai, and passed from this latter town across the Tangnu Oola range towards Minussinsk, in Eastern Siberia. The result of this latter journey is the accurate measurement of altitudes in the Tangnu Oola Mountains, and the rectification of our maps regarding the hydrology of the Upper Irtish.

Burmah.—The Expedition conducted by Major Sladen, our Political Agent at the Court of Mandalay, overland towards the Chinese frontiers, although it has not yet produced those commercial results which were expected, added considerably to our geographical knowledge of that part of Asia. The Expedition, as is well known, was intended to ascertain the possibility of opening up a route for commerce between the well-peopled and wealthy south-western provinces of China and the British Port of Rangoon, thus saving the extremely circuitous route by sea and along the Yang-tsze-Kiang. Major Sladen ascended the Irawaddy to Bhamo, and then marched north-eastward towards Yunan, succeeding in reaching as far as the town of Momein in that province. Political, rather than physical obstacles, seem to lie in the way of a large traffic being established in this region, the whole of this part of Yunan being dominated by Mahomedan insurgents against the Chinese authority. The information gleaned by this important Expedition is, at present, limited to an official Report scarcely accessible to the public. It is desirable, therefore, that the able leader may be induced to communicate it in some more accessible form, either as a contribution to our Society or as an independent work. Dr. J. Anderson, the Naturalist attached to the Expedition, a memoir from whose pen on the Irawaddy appears in the new volume of our 'Journal,' brought home valuable collections of Natural History, besides an extensive series of drawings and photographs of the little-known wild tribes, and the magnificent scenery, of the Upper Irawaddy and the mountainous region beyond, and I believe I express the wishes of all men of science in this country in hoping that the Indian Government will grant some aid towards this publication.

CHINA.—*The Upper Yang-tsze Expedition of* 1869.—Since the opening of the Yang-tsze-Kiang to steam-navigation as far as Hankow in 1861, and the venturesome expedition of Captain Blakiston's party in the same year, the Upper Yang-tsze has attracted much attention from explorers as well as merchants, &c. In 1869, Sir R. Alcock, Her Majesty's Minister in China, despatched Mr. Consul Swinhoe to examine and report on the commercial capabilities of that part of the Great River, with a view to the impending revision of the Treaty of Tientsin. Mr. Swinhoe was wise enough to invite the Chamber of Commerce at Shanghai to send representatives to accompany him on his journey; and from the joint reports of the party we have obtained much valuable information, both as regards the geography and hydrography of the Upper Yang-tsze and the nature of the products and trade of the region. One of the delegates of the Shanghai Chamber was Mr. A. Michie, one of our Associates, and well known as the contributor to our Journal (Vol. xxxiii.) of a memoir on his former journey from Tientsin to Moukden in Manchuria. These gentlemen fully confirmed the reports of previous explorers as to the great wealth and population of the province of Szechuen. Mr. Swinhoe's party did not go further than the chief commercial city, Chungking, and consequently did not reach the fertile plains of Szechuen. Yet even the rugged country through which they passed is described as being remarkably rich, the soil being particularly adapted to the growth of opium, tobacco, wood-oil, &c., besides furnishing a fair proportion of ordinary cereal crops.

The party ascended in one of her Majesty's gunboats, under the orders of Admiral Sir Henry Keppel, K.C.B., to the town of Ichang, 360 miles higher up the Great River than Hankow, thus practically demonstrating the navigability of the river to that point. At Ichang, however, commences the long series of rapids, which extend for 100 miles to the town of Kwei-foo, and even beyond that point continue to be met with at intervals. Navigation of these rapids by foreign-built steamers is considered impossible for the present, though the native boats carry on a regular traffic on the river by means of towing and an enormous expenditure of manual force.

The examination of these rapids and obstructions by our naval surveyors of this Expedition may, indeed, be considered one of the most important geographical results of the mission. According to Mr. L. S. Dawson, the senior surveyor, there appears to be no hope

of steam-navigation being carried on through what is called the "Gorges of Ichang," that is, the series of reaches between Ichang and Kwei-foo, where the bed of the Great Yang-tsze is contracted between lofty precipices of rocks, and the channel beneath encumbered with huge boulders. The depth of the water in the gorges was found to be generally more than twenty fathoms, but in one gorge forty-four fathoms were obtained. So violent and uncertain are the currents which sweep from side to side among the rocks, that it was found almost impossible to follow out the survey in a boat, with ten rowers. Commander Stokes, of the gunboat *Opossum*, states that the rise of water in the summer in these narrow straits was from sixty to eighty feet; and believes that it is due to the melting of the snow on the mountains between China and Tibet. In the rapids the velocity of the current was from eight to ten knots an hour.

How to bring the large and wealthy province of Szechuen into closer commercial relationship with this country is the interesting problem which the delegates of the Shanghai Chamber of Commerce set themselves to solve. Swift, safe, and easy communication is the obvious desideratum; but the mountainous nature of the country seems to preclude the means which would solve the matter in any other country, viz. railways, at least until the introduction of that admirable conveyance has been assented to by the Chinese Government, and has been tried in some more accessible part of the country, where fewer difficulties would have to be encountered. In the mean time the delegates recommend the extension of steam navigation as far as it can be rendered practicable, viz. to Ichang, a measure which would, it is anticipated, result in a considerable increase in the sale of British manufactured goods in that part of China.

An enterprising Prussian, the Baron von Richthofen, after doing good service to geological science in the United States of America, has, during the last two years, been actively engaged in China in investigating its geology and mineral productions. In 1870, under the auspices of the merchants of Shanghai, the Baron made the journey from Canton to Pekin overland, *viâ* Hankow: and, though the matured results of this important survey will not see the light until the explorer has returned to Europe, and had time to prepare his materials, yet the preliminary Reports he has already published, from time to time, warrant the conclusion that his information will be of the most valuable practical kind. For a perusal of these

Reports, copies of which were forwarded to the Foreign Office, I am indebted to the courtesy of Lord Granville.

The various coal-fields in the province of Hoo-nan have been described by the Baron, and new light has been shed on the mineral wealth of that province generally. As Hoo-nan was known to be a large consumer of foreign goods, it was an object of interest to ascertain how far the principal river which drains the province through the Tungting Lake was navigable by steamers; this point Baron Richthofen settles unfavourably, with regard to the prospect of steam-navigation. Except in the brief and capricious season of floods, the Siang is only capable of floating boats of very light draught carrying a few tons of cargo. On the other hand, however, certain lines of traffic are shown to be well adapted for railways.

After traversing Hoo-peh, and describing minutely the resources of that province, and the capabilities of the River Han, which falls into the Yang-tsze at Hankow, the Baron explored Hoo-nan and Shansi; and in the latter province he met with the richest reward of his labours, "one of the most remarkable coal and iron regions in the world." The Baron estimates the coal-field of Shansi to be considerably greater than that of Pennsylvania, and to be capable of supplying the whole world, at the present rate of consumption, for thousands of years to come. As an illustration of the thickness and extent of these carboniferous beds, he says that were a railway ever to be constructed in that region it would be tunnelled for miles through the coal-beds. These vast resources are not utilised owing to the unskilfulness of the natives in mining, and chiefly to the absence of roads. There being no available water communication, and the bridle-roads being indescribably bad, the coal and iron of Shansi cannot be profitably transported for more than a few miles. The Baron predicts a wonderful improvement in the condition of the people, and the stability of the government, when railways are permitted to connect these great mineral regions with the coast.

Herr von Richthofen has, in one of his Reports, remarked on the deterioration of the climate in Central and Northern China, the present condition of agriculture comparing unfavourably with that of former times, as described in the historical records. This deterioration he attributes to the destruction of the forests for fuel —and this on the very area of some of the richest and most easily worked coal-fields in the world!

This distinguished geological surveyor had in contemplation a

still more important journey, namely, from Pekin, through Shensi, Szechuen, Yunan, and thence eastwards to Canton; but, when on the point of starting, the atrocious massacre of foreigners at Tientsin occurred, which revealing a powerful conspiracy against foreigners, the Baron wisely declined to trust himself in the interior so long as the people were exposed to such bad influences. It is to be remarked, however, that the Baron speaks in the highest terms of the friendly disposition of the Chinese people when left to themselves.

Whilst the geography and topography of China, as well as its present commercial condition, archæology, and so forth, are continually receiving new light by the researches of many of our talented countrymen and other Europeans in China, whose contributions are published in the 'Journal of the North China Branch of the Asiatic Society,' papers of value are occasionally communicated to our Society and attract much attention. Such, last Session, was the Memoir by Mr. Ney Elias on the 'New Course of the Yellow River,' which gave us for the first time accurate information regarding that remarkable phenomenon, the diversion, by spontaneous movement, of the waters of the great Hoang-Ho, or Yellow River of China, which occurred in 1851, but was not completed until 1853. The investigation of this subject was undertaken by Mr. Elias, one of our younger Associates, through a pure love of geographical exploration, during the summer holidays taken from active commercial pursuits at Shanghai, and the manner in which he carried out his examination did him the highest credit. He traced the new course of the river down to its new embouchure in the Gulf of Pechili, and visited the spot where the river had broken away from its old bed by the rupture of its northern banks, fixing positions by astronomical observations, and making a survey of his route, which enabled him to complete an exceedingly good map of the country he traversed. As Mr. Elias's Memoir and map are published in the recent volume of our 'Journal,' and are consequently in the hands of Fellows, I need not further dilate upon the subject here. Another memoir, in the same volume of the 'Journal,' entitled 'A Journey through Shantung,' by Mr. John Markham, our Consul at Chefoo, gives us a mass of exceedingly curious and novel information regarding this picturesque and wealthy province of China, and especially regarding the city of the great Chinese sage Confucius, which place was visited and

studied under unusually favourable circumstances by Mr. Markham. A third paper, published in our 'Proceedings,'* by Mr. Alexander Wylie, gives an account of a journey made by the author over a part of the interior of China, of which exceedingly little was known, namely, from Ching-tu in Szechuen, overland, and by tributaries of the Yang-tsze, to Hankow.

Australia.—In my last Address I had occasion to notice the expedition of Mr. Forrest into the interior of Western Australia, in search of the reported remains of Dr. Leichhardt's party. Since then, this very able Australian explorer has been wisely engaged by the Governor of the Colony of Western Australia, Governor Weld, on a new expedition, having a more direct practical bearing on local interests than the former one. This was to discover a route by land, suitable for general use, between Swan River and Adelaide. The route would be along the same tract of coast-country, round the great Australian Bight, which was the scene of the great efforts and sufferings of Governor Eyre in 1840-1. Governor Weld's expedition, which has attracted considerable attention in our Australian colonies, I rejoice to add, has been successful, and a narrative of it, illustrated by a fine map, will appear in the next volume of the Society's 'Journal.'

Mr. Forrest's party left Perth, Swan River, on the 6th of April, 1870; reached Fowler's Bay, in the settled districts of South Australia, on the 27th of July, and Adelaide on the 28th of August. The line of march was generally near the coast; but at intervals short trips were made inland, for a few miles, to ascertain the nature of the country. By an excellent arrangement, a schooner with provisions and stores was sent along the coast, touching at three distant points, and carrying that succour to the Expedition which was so indispensable in the arid, desolate region over which it travelled. The country, to Long. 124° 25′ E., was found destitute of permanent water. A little further east, an effort was made to push for the water mentioned by Eyre, in Long. 126° 24′, and Lat. 32° 14′ 50″; and, after eight days of toilsome march, it was re-discovered. Some part of this district was found to be a fine, grassy, level country, about 300 feet above the sea-level, and moderately wooded; further towards the interior, as far as the eye could reach, the land was equally level, but less wooded. Further east, a fine grazing-country was traversed, superior to the settled

* Vol. xiv., p. 168.

portions of Western Australia. The granite region ends in about longitude 124°; and thence eastward, to the head of the Bight, a distance of more than 400 miles, a limestone table-land constitutes the whole of the coast-country. In short, the general impression derived from the Report of this able pioneer is, that nothing but the absence of permanent water, arising chiefly from the level nature of the land and its altitude above the sea (generally 300 feet), prevents the whole of this extensive coast-region from being a promising country for pastoral settlement.

In other parts of Australia the opening up of the vast unknown interior has been gradually progressing since the remarkable journeys of Macdouall Stuart and Burke and Wills (with those of the parties sent in search of the latter), rather by the continued advance of sheep-farmers, in search of new pastures, than by geographical expeditions. The accounts of these enterprising squatters are seldom brought before our Society; but, lately, we were favoured by Mr. T. Elder with a copy of a letter from one of his *employés* in South Australia, which contained an interesting account of discoveries made to the north of Lake Eyre by Mr. John Ross, who had penetrated, in search of pastoral country, as far as 24° 30′ on the meridian of 137°, and found a well-watered region, with the streams flowing southward into Lake Eyre. The account given by this explorer seems to indicate a fertile region in the very centre of the Australian continent. "The country," according to Mr. Ross, "is one continued scene of mountain, hill, and plain, with permanent watercourses in all directions and of various magnitude." What is still more remarkable is the statement that, by river and lake, there are 300 miles of water in this central region available for steam-navigation. This fine country, it will be found on reference to a map, is situated midway between Macdouall Stuart's track across the continent, and Captain Sturt's "Stony Desert," where the Expedition under the command of this courageous explorer suffered so fearfully from the heat and dryness in 1845. It lies also some distance to the north of Warburton's track in 1866, and seems a northerly continuation of the tract of well-watered and, to some extent, swampy country traversed by this last-mentioned traveller.

If the favourable account given by Mr. Ross be confirmed by subsequent exploration, and the promising appearance described by him be not the effect of an unusually propitious season, the ideas generally entertained of the barrenness of the Australian interior will have to be greatly modified, and the colonists are to

be congratulated on the promising future they have before them. At any rate, these and other accounts go far to confirm the opinion of those, who believe that the fertile and barren districts of Australia lie in meridional bands, or in long belts from north to south. To geographers it is peculiarly gratifying to learn, that the progress of settlement and civilisation follows in Australia the lines of route of the great geographical expeditions. It is thus that the telegraph, now in course of construction from Adelaide to the northern shore of the continent, will be laid along the line of march of our medallist Macdouall Stuart.

The Trans-Australian Telegraph, just alluded to, has, indeed, followed rapidly in the wake of geographical discovery. It will have a very important bearing on many topics which have interested the Royal Geographical Society in former years, and is remarkable as demonstrating how quickly Macdouall Stuart's arduous and apparently unprofitable journeys have been made the basis of commercial advancement.

In my Address for 1865,* I gave a rapid summary of the progress of discoveries in this vast country. Commencing with the small area around Sydney—all that was known to the world in 1830—they have extended over two-thirds of its area; now, for the most part, occupied, in a wonderfully rapid way, by enterprising settlers. So rapid has been the progress, that we are apt to forget that it was only in 1862 that the continent was first crossed from south to north by our brave medallist Macdouall Stuart. On July 25th, in that year, he reached the sea south of Melville Island. For his previous and tentative journeys the Royal Geographical Society awarded him a gold watch in 1859, and its Patron's Medal in 1861. In presenting the medal to the Duke of Newcastle on his behalf, I remarked that this journey would not only cause the occupation of the intermediate country,† but would soon lead to the formation of regular settlements on the north coast of the continent: ‡ a prediction fully verified in the establishment of the colony at Port Darwin, and the rapid progress of settlement from the southward. And, further, referring to the prospect of future telegraphic communication, I expressed a hope that the first message should be coupled with the name of our late medallist

* 'Journal,' Vol. xxxv., pp. cxxxiv.-cxliv.

† Ibid., Vol. xxxi, 1861, pp. cviii.-cix.

‡ I have repeatedly advocated the establishment of a Northern Colony. See Addresses, 1859, pp. ccxx.-i.; 1861, p. cviii.; 1862, p. clv.; 1863, pp. clxii.-clxx.; 1865, p. cxlvii.

"Macdouall Stuart." It would have been a bold prophecy that should have predicted so early an extension of this very line of communication. Considering the rival interests between Queensland and the eastern colonies, it is remarkable, that this most western route across the continent should be the basis of the first telegraphic enterprise to connect Australia and New Zealand with the rest of the world.

The legislative sanction of the South Australian Government to the telegraph scheme of Mr. Charles Todd was given in September, 1870, and the surveying parties immediately commenced their operations. The line passes in a northerly direction from Port Augusta, at the head of Spencer Gulf; then along the routes of Stuart, passing Mount Margaret, his final starting-point. At the end of February last, the line was completed and in operation beyond this, and by this time has probably reached the tropic. At the northern end it proceeds to the south-east on leaving Port Darwin, threading a most fertile country, equal, for pasturage and settlement, to the best parts of South Australia, and striking Stuart's track in about lat. 13° 14′ s., within 50 or 60 miles of the north coast. Any doubts regarding the accuracy of Stuart's narrative have been entirely dispelled by the telegraphic parties, who found his camp-trees marked with his initials, and also the recent tracks of a horse, which must have strayed from him, as he relates, seven and a half years previously. Throughout the survey, both in the north and the south, our traveller's reports of the country are entirely confirmed.

The length of this line of telegraph will be about 1800 miles. It is much aided by the circumstance that the River Roper, passed by Stuart, has been found navigable for a considerable distance from the Indian Ocean, affording a ready means of transport for the *matériel*. By means of this telegraph, the northern colony at Port Darwin will be placed in immediate connexion with Java, Singapore, and India, on the one hand, and with the rest of Australia on the other: from both of which directions its prosperity must come. In the interior of the continent, destitute of navigable rivers, and with wide areas suffering periodically from drought, the line will afford a perfect safeguard to settlers or travellers who may be within its range; as, should any adverse circumstances arise, they can at once make their wants known where aid can be obtained. This completion of the telegraphic system from one extremity of the globe to the other will finally solve another problem important

to us, namely, the exact and final determination of geographical positions. I may remind you that this was one of the original objects of the Society, the attainment of which at that period could only be arrived at by long and laborious astronomical and trigonometrical operations, with results known to be open to considerable doubt.

Thus, in our early days, our medal was awarded, in 1837, to Captain Robert FitzRoy, for his surveys, one portion of which was the first complete chain of meridional distances carried around the globe. Yet, with the most refined precautions, the entire series was 33′ of time, or above 8′ of arc, in excess; a portion of which was made at Rio Janeiro at the commencement of the chain. Again, in 1841, Lieut. Raper, R.N., received our Founder's Medal, chiefly for his elaborate discussion of the longitudes of the principal maritime places of the world, which showed how large were the discrepancies, and how much doubt was cast on the best-ascertained meridians. The electric telegraph determines instantly and with perfect accuracy, which is unattainable by ordinary geodetical operations, the differences of longitude between the observing-stations,—a process which has been carried out for all the chief parts of Europe and America. A notable example of this was given in the electrical determination of the difference of longitude between Greenwich and Paris, believed to be the most accurately known of all. After nearly a century of continuous and indefatigable measurements, it was believed to be somewhere between 2° 20′ 15″ and 2° 20′ 24″ of arc; but in 1854 M. Le Verrier determined, from a mean of nearly 2000 electric signals, any single one of which was more accurate than all the previous measurements, that the true difference is 2° 20′ 9·45″ of arc, or more than a second of time (a large quantity in astronomy) less than previous results.

New Zealand.—Dr. Haast, the very able geological surveyor of Canterbury Province, New Zealand, has sent us a valuable contribution on the physical geography and topography of the New Zealand Alps, in continuation of his important memoirs published in volumes xxxiv. and xxxvii. of our 'Journal.' The recent paper, which he modestly puts forth as Notes to accompany his Topographical Map, which itself is a magnificent addition to New Zealand geography, contains some observations of striking interest on the changes which have preceded the present physical condition of this central part of the Southern Island. It is by such observations that the science of geology is brought into close connexion

with that of geography, and the conclusions are of equal interest to the students of both these great branches of human knowledge.

Dr. Haast compares the snow-clad mountains of the Canterbury Province, which, as you are aware, lie parallel and near to the western coast of the island, to the Alps of Europe; and shows the similarity between the two in their glaciers, and especially in the action of the warm winds, which, blowing from hotter regions, cause a rapid melting of the snow on the side of the mountains facing the direction of the wind. In fact, all the principal meteorological phenomena encountered in the European Alps occur also in New Zealand, the "nor-wester" of the latter country being the representative of the "föhn" of Switzerland. The nor-wester having blown over a wide extent of ocean, and become charged with moisture, is the chief source of the copious precipitation which, in the form of snow, caps the New Zealand peaks, and forms those large fields of névé which supply the great glaciers of the country. The glaciers and snow-fields are stated by Dr. Haast to exceed in dimensions those of Switzerland; and he adduces further proof of the curious fact, which had already excited much interest among physical geographers, that glaciers descend much lower on the western than on the eastern slopes of the mountains, and on the West Coast are in close contiguity to a luxuriant forest vegetation, consisting of pines, arborescent ferns, and flowering shrubs; such, for example, are the Francis Joseph and Prince Alfred glaciers. On the eastern side, although of larger dimensions, they descend in the Canterbury Province no lower than 2500 feet above the sea-level. The cause of the difference is owing partly to the smaller amount of moisture on the eastern, or leeward side, and partly to the less abrupt slope. Large as the New Zealand glaciers and snow-fields are at present, they were formerly, in post-pliocene times, much more extensive: proofs of this are seen in all directions, in vast moraines heaped around the lakes lying at the foot of the mountains, and in marks of glacier action at levels far below their present limit. Dr. Haast believes that the elevated plateau districts, which support the névé fields, were at that time much more extensive, and that glaciers, reaching the sea, gave off from their extremities detached portions, which floated away to the North as icebergs, as they do in Greenland at the present day.

With regard to other parts of these important islands, I may mention that a lively picture of the volcanic districts of the Northern

Island of New Zealand was given in Lieut. Meade's journals, published last year; and that a valuable Paper on the Province of Southland, by Mr. Marten, has recently appeared in Mr. S. W. Silver's 'Circular and Colonial News.' This Paper is one of the results of a printed series of suggestions and queries regarding physical geography and statistics which Mr. Silver issues to his numerous correspondents in all parts of the world where commercial relations have been established.

New Guinea.—The proximity of our new settlement at Cape York, and the number of vessels engaged in the pearl and Bêche de Mer fisheries in Torres Straits, have led to more frequent communication with the natives of that great and still almost unknown land, New Guinea. In my last Address, I had occasion to notice a visit made by Captain Delargy to a village on the southern coast of the island, concerning which the most remarkable circumstance was the friendly welcome accorded to the strangers by the distrustful and warlike natives. Since then we learn from an official report of Lieutenant Chester, the Government Resident at Somerset, Cape York, that he himself visited a native settlement on the south coast, in company with Captain Banner. It appears that a display of armed force and great precaution are necessary in these undertakings; and the native interpreter brought from Warrior Island, in the Straits, was careful to recommend to Lieutenant Chester to say to the Papuan chief of the village that, although desirous of being on friendly terms with him, he was prepared to fight if the natives preferred it. No progress, in fact, has been made towards winning over these formidable people to peaceful commercial relations with the traders of the Australian seas; and not a little of the difficulty, according to Lieutenant Chester, arises from the criminal plundering of the native plantations by boats' crews landing on the coast. Unprovoked aggression on the part of the Papuans, he believes, is not likely to occur, as their well-constructed villages and large well-fenced plantations are too valuable to be lightly risked. An interesting item of ethnological information contained in his narrative, is the existence of wild tribes of aborigines in the interior, with whom the agricultural coast villagers are in frequent hostility.

South America.—In the continent of South America the work of exploration and survey is making steady, if somewhat slow, progress. Several of the independent Governments are now, or have lately

been, engaged in the systematic survey of their vast and thinly-populated territories, publishing the results in maps of greater or less completeness. Thus, the Republic of New Granada, now called the United States of Columbia, lately brought out an Atlas founded on the incomplete surveys of Codazzi; and the prosperous State of Chili, as I had occasion to record in my last Address, is following the example, by issuing well-prepared maps of its central provinces. In the great Empire of Brazil no accurate official survey has yet been instituted of any large portion of the country, but partial surveys, particularly of the Southern Provinces, the River San Francisco, and large portions of the Amazons have been executed; and we have lately learned that an Imperial Commission has been appointed for the preparation of a general map of Brazil, in which the material furnished by all these local surveys will be for the first time made available to geographers and the public in cartographical form. The Commissioners have been in correspondence with our Council, through our Medallist Mr. Chandless, with a view to the amicable interchange of geographical information.

The Government of Peru has continued the laudable work of exploration of the little-known interior of their country, to which I alluded in the Anniversary Address of 1869. For my information regarding the progress since made, I am indebted to our able corresponding member at Lima, Don M. Felipe Paz Soldan. According to his Report to our Council, the general survey of the more important rivers of the trans-Andine territories of Peru has continued without interruption; the Government of Peru attaching much importance to this work, as being indispensable to the peopling of these fertile regions, and the opening-up of communications with Europe by way of the Amazons and the Atlantic. River steamers have been built and costly establishments maintained, directed by European and North American engineers and surveyors, in pursuance of this great object. The exploration of the Rio Utcubamba and others, has been entrusted to Mr. Arthur Wetherman, who has made an accurate survey, fixing numerous points by astronomical observation. The Pachitea River has also been more carefully examined, and found to be easily navigable,—a result of much importance, as it confirms the hopes that a great commercial route will be soon established, leading from the peopled districts of Peru to Europe by means of the Amazons (with which the Pachitea communicates) and the Atlantic Ocean. A little further south, the survey of the large rivers flowing towards the Amazons from

the neighbourhood of Cerro de Pasco and its silver-mines has been undertaken. Three rivers—the Paucartambo, the Occobamba, and the Chanchamayo—here unite to form the Perene, a stream 350 feet broad and 3 fathoms deep. The interesting problem still remains to be solved, whether the Perene is navigable to its junction with the Tambo and the Ucayali; in which case a river-navigation of enormous length, by steamers, will be possible from the Atlantic to within a moderate railway-ride of Lima.

An important contribution to our knowledge of the river-systems of South America is the result of the Surveys of the Rapids of the Madeira River, by Messrs. Joseph and Francis Keller, engineers in the service of the Brazilian Government. The object of these surveys was to ascertain what engineering works will be necessary, in order to overcome the obstacles which these Rapids offer to rapid communication, between the Atlantic and the interior provinces of Brazil: a question in which the Republic of Bolivia is also greatly interested, for the River Madeira appears to offer to the rich interior provinces of that country by far the readiest means of communication with Europe. According to the survey of the Messrs. Keller, there are no fewer than 18 cataracts and rapids, in succession, on the Madeira, obstructing navigation between the Mamore and the River Amazon, having a total fall of water of 228½ feet in an extent of nearly 230 miles. A railway has been proposed as the best means of avoiding these great obstacles.

From British Guiana we have had, during the past year, the details of the discovery of a waterfall, of great height and remarkable beauty, called the Great Kaieteur. This fall is situated on the River Potaro, a tributary of the Essequibo, on the left bank. It was first discovered by Mr. Charles B. Brown, of the Geological Survey of the Colony, in April, 1870, and described by him as formed by the River Potaro precipitating itself over the edge of the sandstone table-land of the interior, into the lower country of the Essequibo Valley. The total height was found to be 822 feet, and the width of water, at the edge of the fall, 123 yards. So interesting a discovery excited much attention on becoming known at Demerara, and Governor Scott commissioned Mr. Brown to make a second visit in June to make a more complete survey; the official Report resulting thereupon giving us most satisfactory details as regards the falls, as well as the geological and botanical features of the district. Thanks to the Geological Survey of this important tropical Colony, we are now tolerably well acquainted with its lithological structure and

mineral productions, and it is to be hoped the result will be published in a form accessible to the public. In the discussion which followed the reading of Mr. Brown's Report at our evening meeting, Mr. J. G. Sawkins, the Director of the Survey, alluding to the flat-topped mountains and table-lands which form so peculiar a feature in the scenery in the interior of British Guiana, gave a vivid description of Mount Roraima,—first visited by Schomburgk,—the most remarkable of these elevations. It is a huge mass of light-red sandstone rock, 18 miles in length, with perpendicular sides and perfectly level summit, rising 7500 feet above the level of the sea. The flanks, forming bare, vertical walls 1500 feet high, are insurmountable; but the summit is known to be the source of several streams, which leap from the edge of the plateau in magnificent cascades, and flow in different ways to feed the Essequibo, the Orinoco, and the Amazons.

At the southern extremity of the continent a remarkable journey was performed in 1869-70, by Lieutenant G. C. Musters, throughout the whole length and breadth of Patagonia, a country hitherto deemed one of the most inhospitable in the world, and inaccessible to travellers on account of the hostility of the savage tribes who wander over its desolate plains. The account of his journey, given by Lieut. Musters at our evening meeting of the 13th December last, excited the liveliest interest. Scarcely anything was previously known of the interior of this country, as will be seen on reference to the excellent summary of Spanish and other expeditions, given by our secretary, Mr. Markham, on the same evening.* In fact, little more than short excursions inland from the coast had been made, throughout the vast extent of land between the Straits of Magellan and the Rio Negro. Lieut. Musters traversed the whole of this unexplored region, first crossing from Punta Arenas, in the Straits, to Port Santa Cruz, then in company with a tribe of Patagonians, whose goodwill he had succeeded in gaining, skirting the eastern flanks of the Andes for 700 miles to the Rio Negro, and finally recrossing to Patagones, near the mouth of this river. Lieut. Musters's paper,—which will be published entire in our 'Journal'—gives us much new information concerning the rivers, lakes, soil, and climate of the country, and especially of the peculiar character and habits of the aborigines. His journey may, indeed, claim to be ranked among the most adventurous and successful of those

* 'Proceedings,' vol. xv. p. 49.

which have recently been undertaken by our enterprising fellow-countrymen.

Arctic Exploration.—Of the numerous Expeditions which have been sent by Sweden, Germany, and the United States of America to explore the North Polar Regions, since the days when England took the lead in that field of hardy enterprise, the voyage of Count von Zeil and Herr von Heuglin last summer, in East Spitzbergen, has probably offered most novelty to geographers. This undertaking was carried out in the months of July, August, and September, and its object was to penetrate to the eastern channels and islands of the Spitzbergen group, which had not been visited by the previous Swedish expeditions under Nordenskiöld, Von Otter, and others, and, in fact, had hitherto remained little better than a blank on our maps. That blank, thanks to the enterprise of these gentlemen, is now filled up, and the information imparted, owing to the well-known scientific qualifications of Herr von Heuglin, is exact and comprehensive. The small vessel in which the party sailed proceeded, first towards Edge Island or Stans Foreland, and, on finding the ice not yet cleared from the south-west coast, struck westward and then northward, navigating the whole length of Stor Fjord as far as Helis Sound. Landings were effected at many places on the east coast of the main island of Spitzbergen, as well as on the two large islands to the eastward; excursions were made in the interior, and astronomical observations and bearings taken to fix positions, besides large collections obtained in illustration of the natural history of the group. At length, in the middle of August, they succeeded in passing by boat through Freeman, or Thymen Strait, to the eastern side of Stans Foreland, and from Mount Middendorf, a hill on the shore of the strait 1500 feet high, were gratified at beholding in the far distance to the east, a large tract of land, with a range of lofty serrated peaks extending north and south for nearly 60 miles. Whether this land is the enigmatical Gillis-land, of which we have so often heard, appears not fully decided, but unquestionably these enterprising German voyagers have brought us for the first time definite information regarding this unvisited region. In returning, they skirted the western coast of Stans Foreland and visited Deicrow Sound, at its south-west extremity, early in September, before turning their faces homeward.

According to Von Heuglin the passability of these seas and channels entirely depends on the direction of the various branches

of the Gulf-stream and of the Polar current. The latter divides, in the high north, into two branches, one of which flows down the eastern side of Greenland, and the other down the eastern side of Spitzbergen; the Gulf-stream presses north-eastward, washing, therefore, the south-westerly sides of the Spitzbergen Archipelago. These currents have a decisive influence on the climate of the coasts; where the Gulf-stream flows the ice becomes more quickly broken up, and a milder temperature is communicated to the air; but the Polar current, scarcely higher than freezing-point, even in the height of summer, keeps the ice in its neighbourhood from separating until the beginning of September, when a little is broken up and drifted south. It is, therefore, only in the latter part of the summer that the North Polar Sea is at all accessible.

This Expedition appears already to have stimulated other German efforts to follow up the same promising line of Arctic investigation; for I learn by a recent German publication that a small Norwegian vessel is to be equipped this summer, and a reconnaissance survey of the sea between Spitzbergen and Gillis-land to be made by Lieutenants Payer and Weyprecht, at the cost of the Austrian Government. The Swedes on their side are proposing to establish a permanent astronomical, magnetic, and meteorological station at Spitzbergen, with a view of preparing the way for renewed Arctic exploration; Professor Nordenskiold, who already enjoys a high reputation as an Arctic explorer, having the intention next year of making a vigorous attempt to reach the North Pole, making the proposed Spitzbergen establishment his base of operations.

Regarding the German North Polar Expedition of 1869-70, under Captain Koldewey, in the *Germania* and *Hansa*, our Society has had the advantage of hearing an excellent account of this adventurous voyage and its results, from the pen of Sir Leopold McClintock, who is so well qualified by his great Arctic experience to do justice to such a subject. Naturally basing his narrative on German accounts of the Expedition, especially that given in Petermann's 'Mittheilungen,' Sir Leopold limited his own remarks to well-deserved praise of the ability with which the details of the enterprise were carried out, and especially the endurance of the heroic crew of the *Hansa*, who, having to take refuge on an ice-floe in the open sea, on the destruction of their vessel in a fearful storm, were drifted southward several hundred miles, to within reach of a Danish settlement near the southern extremity of Greenland. As far as geographical discovery is

concerned the Expedition did not accomplish much, but the staff of scientific men belonging to it, succeeded in amassing a large amount of material in all branches of science, which we are assured will prove, when published, of great value. The *Germania* wintered near the southern end of Pendulum Island, near the locality of Sir Edward Sabine's magnetic observatory, when he visited the locality with Captain Clavering in 1823. From this point sledging expeditions in the spring of 1870 were undertaken, which reached as far as 77° north latitude. In returning down the coast a fiord, penetrating far into the interior of East Greenland, was discovered and partly explored. It is situated between Capes Franklin and Humboldt, and was found to be surrounded by a highly picturesque mountainous country, with sheltered and verdant pastures near the water, inhabited by herds of musk-oxen and reindeer. Some of the peaks in the neighbourhood were found to reach the height of upwards of 7000 feet. These inlets of deep navigable water, possessing a mild climate and abounding in animals, but unpeopled by Esquimaux tribes, seem to be most promising avenues to the exploration of the interior of Greenland, and it is to be hoped that some of our young English geographers, desirous of earning fame as discoverers—of whom I am proud to say we still number a few amongst us—will devote their energies and means in following up the opening thus indicated. From our Government, I deeply regret to add, no aid is to be expected.

I ought to mention, in connexion with this important voyage of Koldewey, which is designated the "Second German North Polar Expedition," that a Society was founded, last autumn, in Bremen, called the German North Polar Society, having for its object the promotion and management of all German efforts in the direction of Arctic enterprise. This Society has already held fourteen meetings, and publishes its proceedings. An important part of its present labours is the publication of the results of the voyage of the *Germania* and *Hansa*, of which the first volume is said to be ready for the press.

Before I quit the subject of Arctic enterprise, I must not omit to mention that our relatives and rivals on the opposite side of the Atlantic have furnished the means to equip the well-known Arctic traveller, Mr. Hall, for another journey, during the present summer to the Polar regions, from the American side. Dr. Bessels, a German savant, who has acquired Arctic experience in a former voyage to Spitzbergen, is engaged as zoologist to this expedition,

and Dr. D. Walker, one of our Associates, formerly surgeon to McClintock's exploring party, as I learn from a letter he has written to the Council of our Society, has also been engaged to accompany it. Having been furnished with a set of instruments on a former occasion for observations in Arctic America, our Associate has obtained permission to employ them in the American Expedition, and I trust we may receive from his pen, at a future day, some account of the exploration on which he is now engaged.

Whilst on the topic of Arctic discoveries, I am happy to be able to announce that our distinguished Associate, Captain Allen Young, intends to explore, as far as possible, and at his own cost, the interior of the fiords of East Greenland, and to devote future years in making geographical discoveries in his own yacht.

Again, I have just learnt from Mr. William Bradford, of New York, that in a vessel of 400 tons, manned by a crew of Nova Scotians, he has taken photographic sketches of all the principal features on the west coast of Greenland, up to latitude 76°.

In this survey he was accompanied by our Medallist, Dr. Hayes, and he speaks in high commendation of the bravery and ability displayed by the young British colonist who commanded his vessel.

Africa.—Concerning Africa, which usually offers so much geographical interest and novelty, I have this year but little to report, as regards discoveries by English travellers. The great Expedition of Sir Samuel Baker was, by the last accounts, slowly working its way, by the Giraffe arm of the White Nile, towards Gondokoro and the Albert Nyanza, and had, therefore, not yet entered upon the field where so much yet remains to be accomplished in the way of new exploration. In the south, we have received an account of the explorations of Mr. Thomas Baines, in the region between the Limpopo and the middle course of the Zambesi; in which direction this persevering traveller has been employed in examining the locality of the gold-fields and negotiating the privilege of working them with the Matabele chiefs. Mr. Baines' narrative (compiled from his itineraries by Dr. Mann) will appear in our 'Journal,' and his map will be seen to offer, for the first time, an accurate delineation of the watershed which limits, in that region, the Limpopo and Zambesi basins.

Dr. Livingstone.—The recent advices from Dr. Kirk, which were kindly communicated to me by Earl Granville, must have been

truly gratifying to all my Associates to whom I communicated them, as well as to the public at large. I have now a confident belief that the illustrious traveller was safe and well a few months ago.

Knowing that he was about to be fully supplied with provisions and medicine when he reached Ujiji from the west, we may anticipate that he might return to his native country in the course of this year.

But I now repeat the expression of the opinion which I published in my Address at the opening of the present Session, that if he had not, in his explorations, satisfied himself that the waters which he had followed from the south, flowed into the Nile basin by the great lake Albert Nyanza, he would renew his arduous endeavours to solve the great problem of the true watershed of Southern Africa. The indomitable spirit of Livingstone would, in this case, prompt him to struggle until that great point was settled.

Even, however, as matters now stand, the last intelligence was a very cordial message to myself, who have so long and so persistently looked to the eventual success of my absent friend.

Schweinfurth's Journey.—Whilst waiting for the account of the discoveries which Dr. Livingstone cannot fail to have made in the region west of Lake Tanganyika, geographers have been gratified to read, in Petermann's 'Geographische Mittheilungen,' the narrative of the explorations of the indefatigable German botanist Dr. Schweinfurth, in the region west of the White Nile and far to the north of the scene of Livingstone's explorations. As you are all aware, the accounts we had previously received of this portion of the African interior were limited to the narratives of Petherick's two journeys of 1858 and 1862, and to the accounts of the Expedition of the late Miss Tinné from the mouth of the Ghazal River to beyond the Djour. Since those remarkable journeys, we had heard only in a vague way of discoveries by the agents of the Messrs. Poncet, ivory-traders in those districts; and also of the journey, far to the south, of Signor Piaggia, who, having been received in a friendly manner by the chiefs of the Niam-Niam tribes, was able to travel further to the south-west than any of his predecessors, and brought back a report of the existence of another great lake in that direction. The accounts of these last-named travellers, however, did not admit of being delineated with any approach to accuracy on our maps; whilst from Dr. Schweinfurth, who is still engaged following up his investigations, we have a

large body of accurate information, founded—in the absence of astronomical observations, for which he had not the necessary instruments—on a carefully-made route-survey. He has succeeded in reaching a point about 50 miles beyond Piaggia's furthest, and 210 miles to the west of the White Nile, nearly on the same parallel as the northern end of Albert Nyanza; but he does not confirm the Italian traveller's rumour of a great lake so far to the west. His most important discovery appears to be that of a river, the Uelle, flowing westward, probably into Lake Chad, proving that he had crossed the watershed of the White Nile on the western side of its basin.

Connexion of Geographical with Geological Science.

In the Anniversary Addresses delivered by me to the Society during the last three years, I have dwelt upon the connexion between geography and geology, more particularly in the direction of Physical Geography. From the evidence furnished to us by the rocks around us, whether of a physical or a palæontological kind, we are able to re-construct, in part at least, former conditions of the earth's surface, and to learn how the present outlines of land and sea, and the present distribution of plants and animals, are not original, but only the latest phases of a long-preceding succession. Geology thus becomes to us what I termed "the oldest comparative geography."

It is unnecessary for me to point out that just as in descriptive, and still more in physical geography, it is of primary importance to have regard, not merely to the external contour and climate of a country, but to the grouping of its plants and animals, so in geological research it is absolutely necessary to make constant appeals to the evidence furnished by the remains of the flora and fauna of ancient periods. Hence, though at first sight there might seem to be no very close or necessary connexion between geology, or, at least, that aspect of geology which I have called the oldest comparative geography, and the more purely biological sciences, there is in reality an intimate relation of the one to the other. And thus, in these my final and parting words to the Geographical Society, while I again bring under your notice the claims which the progress of Geology makes upon you, I wish to refer to this

relationship, not alone for its own interest and importance, but because it gives me an opportunity of expressing a growing conviction of my later years that, alike in geographical and in geological research, we run some risk of being overshadowed and even elbowed out of an essential portion of our proper course as geologists by the paramount demands of some eminent biologists. No one who knows what my connexion with geological study has been, will allow himself to suppose that in what I now say I would in any way depreciate the due importance of the biological branches of that science. I have indeed been accustomed, throughout my career, to bow to the weight of palæontological evidence, and to this, my earliest and latest faith, I still remain true. But I cannot shrink from thus publicly expressing a feeling which has recently grown strong within me, that the biological side of geology has by some of my contemporaries been too exclusively cultivated; that palæontology has acquired a somewhat undue preponderance amongst us; and that the value of physical or inorganic geology is not now being sufficiently appreciated. If, indeed, men were in any measure agreed as to the origin and progress of the various forms under which life has been manifested in the history of the world, if they had arrived at a common understanding as to the value of species, if they knew with any approach to completeness how far life is dependent on, and modified by, external physical conditions now, and how far similar relations have obtained in the past, there might be some show of reason for the paramount authority of palæontological decisions when they are set against physical data. But when we reflect on our slight acquaintance with the laws which regulate the interaction of organic and inorganic nature at the present time, on our ignorance of that interaction in former geological periods, on the little that we know regarding the true value of our fossil species, on the difficulty of ascertaining the true contemporaneousness of distant formations, and on the vast mass of fossiliferous rocks still unexplored,—it does seem to me that greater modesty and caution in the application of palæontological *dicta* are to be recommended. Whatever may be the doctrine we espouse as to the origin of species, we see on every side of us in the living world of to-day how constantly, and how momentously, the conditions of life are defined and modified by inorganic forces. Apart from, and imperiously governing the progress of life around us, there is the world of physical or inorganic nature—a system of

ceaseless law-directed change, of endlessly complicated agencies working harmoniously together and involving all things, organised and unorganised, in one common mutability. If such is the order of nature now, and if our view of nature would be but partial and distorted, in contemplating merely the biological domain, surely we err when we, in like manner, allow ourselves to see things in the past too exclusively through that medium, and neglect to take due cognisance of the evidence of former physical changes.

By neglecting the study of physical geography, geology has become, among certain influential writers, too much the study of palæontology only. Those writers must not forget that there has been a history of dead matter as well as a history of life; that mineralogy, petrography, structural and stratigraphical geology, and physical geography, deal with essential and integral parts of the past history of our planet. Things, indeed, have gone so far, that when there is a confliction of evidence between the testimony of the fossils and that of the rocks in which they lie, such authors, almost invariably, and as a matter of course, bow to the palæontological argument. I have myself done so, even against what I may perhaps have thought, or, at least, think now to have been my better judgment. I cannot but believe that, ere long, a reaction will set in against this tendency. And, in the mean time, some geologists will do well to pause in their too exclusive worship of the biological side of their science. I wish to put this note of warning on record, and to urge my brethren of the hammer to believe that, in the study of fossils, they do not exhaust the possibilities of geology; that there is still a wide non-biological world for them to conquer; that in proportion as they master it they will advance to truer and more comprehensive views of the history of life, and thus aid us in the investigation of that planet with which we, as geographers, are specially concerned.

Conclusion.—In concluding this Address, I now come to the only painful duty I have ever had to perform, since I have had the honour of presiding over the Royal Geographical Society.

I have to bid you farewell, and I do so solely on account of the malady with which I have been visited; for I well know, that if I had not felt it incumbent on me to resign the Chair, your never-failing kindness would have urged me to continue to serve you until the next Anniversary.

In retiring, I have the satisfaction of knowing, that I leave the Society in the most highly flourishing condition, and that I can reflect with just pride upon the progress it has made since the year 1843, when, succeeding to your excellent President Admiral Smyth, I was, by his advice, first placed in the Chair. In the period which has elapsed since that date, I have been for fifteen years your President; and when other persons have been in that post, I have zealously aided them to sustain your interests, and have prepared and read to you sixteen Anniversary Addresses.

In my endeavours to serve you, it was with the heartiest satisfaction that I supported the endeavours to extend Arctic Discovery: and either when I wished God speed to my lamented friend Sir John Franklin, or when that great navigator was missing, I can reflect with honest satisfaction on the fervent—though, alas! vain—appeal I made in your name to Her Majesty's Government, to endeavour to rescue him and his brave companions. Then, again, when his devoted wife made that final effort which, through the researches of Sir Leopold McClintock, terminated in establishing the truth as to the fate of those brave explorers, so I never relented in my support of that magnanimous woman, Lady Franklin, until I had the true gratification of presenting to her, in your name, one of our Gold Medals for her heroic efforts.

It would be very bad taste on my part were I to advert to the many instances in which I have been intimately concerned in acts which I know that the Fellows of the Royal Geographical Society have duly appreciated as being of importance. Among these I need not remind you of the attainment of the support of Parliament, and thereby of our recognition as an important and highly-useful scientific body.

Amidst the many duties which it has been my good fortune to perform, I can dwell upon none with more satisfaction than those by which I sustained the daring efforts of the explorers of Africa,—Livingstone, Speke, Grant, and Baker: whilst I have rejoiced in the steadfast pertinacity with which I have upheld my confidence in the ultimate success of the first-named of these brave men. In fact, it was the confidence I placed in the undying vigour of my dear friend Livingstone which has sustained me in the hope that I might live to enjoy the supreme delight of welcoming him back to his country.

I have now only, gentlemen, to offer you my heartfelt thanks

for the unvarying heartiness with which you have supported your old President, whose name was, by your kindness, the only one inserted in the Royal Charter by which you are embodied, and who leaves you with feelings of just pride when he reflects that he has been thus identified with your past and future successes, and that your numbers, which amounted to 600 only when he first was placed in the Chair, have now risen to the large total of 2400.

If, as I hope, you elect Sir Henry Rawlinson as my successor, I anticipate the most gratifying results in your future career; for you will be led forward by an eminent scholar and great explorer, who, as far back as the year 1840, won one of your Gold Medals for his most remarkable researches in Susiana and Persian Kurdistan, and who also determined the former existence of the ancient cities of Ecbatana, and threw quite a new light on the comparative and physical geography of Western Asia.

Since the days of his early researches, which we geographers were the first to recognise and reward, he has rendered his name famous by his able and elaborate works on ancient Babylonia; and whilst on every subject relating to Central Asia he has evinced much knowledge, we have had to thank him for the perspicuity with which he brought our late lamented envoy Mr. Hayward to our notice.

Under his auspices you are destined not only to direct the exploration of vast unknown lands, but also to bring to the mind's eye of moderns, many of the past glories of the great eastern empires of antiquity.

Postscript.—Whilst on the point of concluding my Address, I received the melancholy announcement of the death of my old and valued friend Sir John Herschel. This truly eminent man, whose acquirements in every branch of science were almost unrivalled, although not a Fellow of our Society, was an admirable geographer in the largest sense of the word. He had worthily received the highest honours which could be conferred upon him by every scientific Academy of the world: and in 1845 he presided over the British Association for the Advancement of Science, at Cambridge.

The mention of this fact leads me naturally to take this last opportunity in my power of leaving behind me a record, however brief, of the high merits of another most distinguished leader--

indeed, he was the Law-giver—of the British Association, though he also was not a Fellow of our Society. I mean the Rev. William Vernon Harcourt, to whom I was most truly attached, and who succeeded in giving so great an impulse to the spread of true scientific knowledge. I have no doubt that the President of the Royal Society, Sir Edward Sabine, will do ample justice to the scientific characters of these two remarkable men, who, as well as myself, was long associated with them in conducting the business of that great national body.

Sketch Map of the TRANS-INDUS COUNTRIES including GILGIT, DILAIL, YASSIN &c.

by Geo J W Hayward

Mr Haywards Route

Nanga Parbut or Dayamur Peak 26629

English Miles 2 4 6 8 10 20 30 40

Geographical Miles 2 4 6 8 10 20 30 40

Longitude East 74

73 74 75 76

37 36 35

PAPERS READ

BEFORE THE

ROYAL GEOGRAPHICAL SOCIETY

DURING THE SESSION 1870-71.

[FORMING VOL. XLI. OF THE SOCIETY'S JOURNAL.
PUBLISHED JULY 1st, 1872.]

I.—*Letters from* Mr. G. W. HAYWARD *on his Explorations in Gilgit and Yassin.*

Read, November 15, 1870.

1. LETTER FROM MR. G. W. HAYWARD TO COLONEL SHOWERS.

"Camp Roshan, between Gilgit and Yassin,
"17th February, 1870.

"MY DEAR COLONEL SHOWERS,

"As you are good enough to take an interest in the exploring expedition to the Pamir, and expressed a wish to hear of my progress by Gilgit, I am glad to be able to let you know that I am on the point of entering Yassin, which place is only some 12 miles distant from my present camp. Some delay was experienced in Gilgit, and an advance to Yassin was for some time doubtful; but at length a favourable answer was received to my application to Meer Wulli Khan, the chief of the country, to be allowed to visit Yassin. He has sent an official to escort me in, and comes out himself to-morrow morning to meet me *en route*. Judging from his letter and friendly expressions, a favourable reception seems certain. He is related by marriage to Aman-i-Moolk, the chief of Chitral, and if I can obtain the latter's goodwill through Meer Wulli Khan, there should be no great difficulty in penetrating to the Karakul. Should the Yassin chief further my views, and render assistance as far as Wakhan, it will not be imperative to visit Chitral, since his vakeel mentions a very good route leading direct from Yassin

viâ the Darkote Pass to Gujal in the basin of the Oxus, thence to Shignan, Roshnan, Derwaz, Kolab, Hissar, and Shahr-i-Sabz. This route entirely avoids Chitral. After crossing the pass at the head of the Yassin Valley, it would appear that one gets into a valley giving exit to one of the branches of the Upper Oxus. A road branches to the east *viâ* Sarikol, to Yarkand, and the direct road leads down into Shignan. Our maps must be very faulty in their delineations of the country about the Pamir and the junction of the Hindu-Kush and Karakoram chains. The watershed between Wakhan and Sarikol must be more to the eastward than is represented, for the passes from the head of Yassin and the Gilgit River lead into the basin of the Oxus, and not into the Sarikol district; as Yarkand and Kashgar are more to the eastward than given in our maps, so the eastern crest of the Pamir range should be found to correspond, and I believe it will be found to follow a meridian of about 75° of east longitude. There appears, however, to be no probability of effecting an immediate advance beyond Yassin, as the passes are deep in snow, and will not be open for two or three months. After arranging with the Yassin chief for the onward journey, it will be advisable to return to Gilgit, or perhaps even to Kashmir, until the road is open, for it would be impolitic to linger in such risky ground close to Chitral, the goodwill of whose chief cannot as yet be depended upon.

"Gilgit itself is a place of some 200 houses, situate on the right bank of the river, rising in two branches in the angle formed by the junction of the Karakoram and Hindu-Kush ranges, and joining the Indus near Boonji. It is in lat. 35° 55′ 2″ N., long. 74° 22′ E., and 5025 feet above the sea. The Kashmir authorities have a large fort occupied by some 900 men, commanding the valley, and the Maharajah's territory may be said to end at Gahkuch, some 24 miles beyond, in the direction of Yassin. They are not on the best of terms with the Hunza-Nagar and Yassin people, whose territories they have several times invaded, but they have invariably been driven back after suffering heavy losses. Hunza itself appears to be impregnable to them, on account of the difficult approach through the mountainous country. They have twice attempted it, but have fled back to Gilgit precipitately, and suffered heavily. The Hunza tribe, mustering about 700 to 800 fighting men, successfully defend the narrow pathway and roll down rocks upon their foes. A habitual and constant feud has thus been engendered; for the tribes, being to a man rigid Mahomedans, regard with no friendly eyes the Hindus, to which caste most

of the Kashmir troops belong. It is probable that the Kashmir troops will again advance to the head of the valleys, and endeavour to annex Hunza and Yassin, or will have to retire to their natural frontier the Indus. They will hardly be able to hold Hunza should they seize it, for they have tried the onward movement and have even reached Yassin, but have been driven back after burning and plundering as many villages as they were able.

"The inhabitants of Dardistan, in which may be included Gilgit, Chilas, Hunza-Nagar, Dilail, and Upper Chitral, are a fine, good-looking, athletic race, and the difference of race is at once perceived on crossing the Indus. Light and dark brown hair, with grey, hazel, and often blue eyes, are seen. The women have a more English cast of countenance than any I have yet seen in Asia. Black hair is the exception amongst them, light-brown locks prevailing. The country, such as is under cultivation, is fertile and productive, but the population is scanty. Pray excuse a somewhat hurried note, as I am much pressed for time, and remain,

"Yours very truly,

"GEORGE W. HAYWARD."

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2. LETTER FROM MR. G. W. HAYWARD TO SIR RODERICK I. MURCHISON.

"Camp, Yassin, 14th March, 1870.

"MY DEAR SIR RODERICK MURCHISON,

"It is with much pleasure I find myself able to address you from Yassin, which place I have safely reached from Gilgit.

"In order to explain exactly the amount of progress made up to date, it is necessary to briefly mention what I have been doing during the winter months.

"After leaving Kashmir last year, I marched steadily to Gilgit *viâ* Skardo and the Indus valley. The representations made to me by the Maharajah of Kashmir's officials, of the state of the Gilgit frontier, offered little hope of my being able to penetrate to the Pamir Steppe by this route; but arrived at Gilgit, I found matters not nearly so hopeless as I had been led to anticipate. It was at once apparent the Maharajah's officials in Gilgit were anything but pleased at the appearance of an Englishman on that frontier, with the ostensible intention of penetrating further, to do which it would be imperative to make friends of the different tribes, their enemies. And in this has

lain the great difficulty,—to go through either hostile camp, as it were, and still keep friends with both. I sent presents and a letter to Meer Wulli Khan, the Yassin chief, asking to be allowed to visit his country, feeling sure that if they would but let me come on, I should succeed in winning their goodwill. At first the Yassin people were excessively suspicious as to the motives of an Englishman wishing to visit a country, where, I believe, no European has ever been before, and no doubt were inclined to connect my presence in Gilgit with some further aggression on the part of the Maharajah of Kashmir. However, the chief decided to let me come; and I can only say that I have been most well received and hospitably treated. I have now just returned from an exploring expedition up to near the Darkote Pass, leading over into Wakhan and the basin of the Oxus, as well as to the foot of the Moshabur Pass leading over into the Mastuch and Chitral valleys. Both passes are choked with snow, and will be impracticable for laden animals for two or three months yet, while the Pamir Steppe itself can scarcely be free from snow until the summer is well advanced, perhaps not before the end of June.

"I may mention my having received two apparently friendly letters from Raja Aman-i-Moolk, the ruler of Chitral, expressing pleasure at my having made the acquaintance of Meer Wulli Khan, the Yassin chief, his son-in-law, and hoping I will visit Chitral, in which case he offers to do his best to forward my onward journey to Badakhshan or Jellalabad. There is reason, however, to be suspicious of the sincerity of his intentions. The tribes here — that is, the inhabitants of Chitral, Yassin, and Hunza—entertain the most bitter feelings of enmity against the Maharajah's rule in Gilgit, and the Chitral ruler would probably like to get an Englishman into his power, to be able to play him off against the aggressions of the Dogras in the Gilgit Valley. The Yassin chief, at any rate, has begged me not to think of going into Chitral at present.

"I have explored nearly all the valleys, in the basin of the Yassin and Gilgit rivers, and the geographical features which I have already discovered may be said to be comprised in the following details:—

"The watershed between Wakhan and Sarikol, *i. e.* the eastern crest of the Pamir, lies some 70 miles to the eastward of the position represented on our maps, since all the passes at the head of the Yassin and Karambar valleys, lead over into the basin of the Oxus, and not into that of the Yarkand River, or the Sarikol district. The Warchagam (or Yassin) River rises

in three branches; the most easterly one in the Darkote Pass, and the others at the head of the Daspur and Moshabur valleys. Below Yassin the Ghirzah River, rising in the Shundur Pass (leading to Mastuch and Chitral) comes down past Shevare and effects a junction. This stream also receives two considerable tributaries, one from the head of the Swat Valley, the other down the Baltibur Valley, up which lies a route conducting to the country of Tangir. The united stream flows to the E.N.E. past Roshan, and then suddenly turns to the south-east. Above Gahkuch, 40 miles from Gilgit, the Ish-Kaman River joins from down the Karambar Valley, up which, at five days' journey distance, is the most easterly pass leading into Wakhan or the basin of the Oxus. There is a large lake at the head of this valley, called Karambar Sar, which has been formed by glaciers falling and blocking up the bed of the stream. An immense amount of water has accumulated, and the inhabitants of the Gilgit Valley fear that should a very hot summer ensue, the lake may burst its bounds, and cause much destruction through the glaciers melting. An inundation from a similar cause took place some nine years ago, and the marks of the devastation then caused are still distinctly visible. The Hunza-Nagar stream joins the Gilgit River four miles below the Gilgit fort. Its two chief branches rise in the Shinshal Pass and at the head of the Garmasai Valley. There are some fine snowy peaks in the Moshabur ridge between the head of the Chitral and Yassin valleys. My measurements of some of them give altitudes of from 21,600 to 22,400 feet above the level of the sea. Our maps mark a town of Kashkar near the head of the Chitral Valley, but there is no such place. The *whole country* is called Kashkar. Yassin, Ponyal, and Mastuch (the districts of) are known as Bura (or Upper) Kashkar; and Chitral as Kuz (or Lower) Kashkar. The position of Yassin itself I have found to be in lat. 36° 22′ 38″ N., long. 73° 35′ 15″ E., and 7765 feet above the sea. The Gilgit Valley varies in elevation from 5000 to 5600 feet. The wheat produced is particularly fine and large-grained, while the country is rich in vineyards and orchards of apricot-trees. Ruined villages and waste land, however, meet the eye everywhere,—the unhappy results of the incessant feuds waged between the mountaineers (who are to a man Mahomedans) and the Dogra troops of the Kashmir Rajah. The atrocities practised by the Dogras are a disgrace to a feudatory of the British crown. During their raid into Yassin territory, in 1863, they indiscriminately killed innocent women and children. From 1200 to 1400 of the poor Yassin villagers were massacred by the foulest treachery and cruelty.

A few days ago I visited the scene of the massacre, and after the lapse of seven years have myself counted 147 still entire skulls, nearly all those of women and children.

"The River Indus would seem to have a course from 25 to 30 miles more to the northward (than represented on our maps) after turning westward below Boonji and Chilás. The streams it receives on its right bank are, the Kanbari, Dilial, and Tangir rivers; the countries of Dilial and Tangir intervening from Swat to Gilgit. Of these streams the Dilail River is the largest, and joins the Indus some 27 miles below Chilás at Sazeen.

"As the passes leading on to the Pamir cannot be practicable until May or June, I may find it advisable to return to Gilgit and there wait for the proper moment to advance, for a prolonged stay here is, to say the least of it, somewhat risky. The Yassin chief has, however, promised to assist me—will even furnish an armed party to accompany me on the Pamir, should I wish it. I do not think there is any necessity to avail myself of this offer; but loading up provisions here for a three months' campaign should ensure success, as the expedition will thus be independent of the Kirghiz.

"I am very sanguine of being able to thoroughly explore the Pamir Steppe during the summer of 1870, for everything promises well for the eventual success of the expedition.

"I greatly wish to accomplish a journey through, and so home by Russia; but if forced to return, shall still endeavour to regain India by way of Chitral and Cabul. A visit to Chitral could not fail to be one of great interest. The Yassin and Chitral chiefs claim descent from Alexander of Macedon, through the kings of Khorasan. I am in hopes of being able to procure a couple of Siah Posh Kafirs to accompany me; so, if unable to enter Kafiristan, I still hope to get hold of their language.

"I trust the Geographical Society were satisfied with my former maps and reports, and assuring you no pains or labour shall be spared to ensure success on the Pamir,

"I remain, my dear Sir Roderick Murchison,

"Yours very sincerely,

"GEORGE W. HAYWARD."

3. LETTER FROM MR. G. W. HAYWARD TO COLONEL SHOWERS

"MY DEAR COLONEL SHOWERS, "Murree, 27th April, 1870.

"You will be surprised to see from the above address that I am back again in the Panjab. You will perhaps conclude that I have failed in Yassin; but, on the contrary, everything promises well for the final success of the Pamir expedition. Briefly to explain my presence here, I went to Yassin, was most hospitably received and well treated, and have the satisfaction of having established a friendship with the Yassin people. The courtesy and bearing of the chief, Meer Wulli Khan, were quite beyond what I expected to meet with in Dardistan. Of course the Kashmir officials were anything but pleased at my success, and secretly did everything they could to prevent my going; but the Yassin chief decided to allow me to visit his territory, and I felt sure that once arrived there I could win his goodwill. Having got the chief on my side is a most important step in my project; and although not all the difficulties, yet certainly one of the greatest has been overcome. While in Yassin I received two letters from Raja Aman-i-Moolk, the Chitral ruler (Meer Wulli Khan's father-in-law) expressing pleasure at my having made the acquaintance of his son-in-law, and hoping I would visit Chitral when the passes opened, in which case he would do his best to further my journey to Badakhshan. Apparently his letter was friendly; but as the Yassin chief begged I would not think of visiting Chitral, at any rate at present, I began to think that Aman-i-Moolk would probably like to get an Englishman into his power, in order to play him off against the aggression of the Maharajah of Kashmir in the Gilgit Valley. I went off exploring and shooting up to the foot of the Moshabur Pass, leading over into the head of the Chitral Valley, and also the Darkote Pass leading over into Wakhan, the basin of the Oxus; and it was evident the passes would be impracticable for laden animals until June. Thinking it dangerous to linger in such uncertain ground until the passes opened, I made every arrangement for a second visit in May, and, bidding a temporary farewell to my Yassin friends, returned to Gilgit. Most fortunately I did so, for the Maharajah's officials in Gilgit (to serve their own purposes) had caused a report to be spread that I had been plundered in Yassin (mark, I was particularly well treated), and had sent off orders to Astor for the whole of the Dogra forces there (from 2000 to 3000 men) to march at once to Gilgit for the purpose of invading Yassin. My return to Gilgit stopped them, and they

hurried back to Astor, but not before I had ascertained the truth of the movement. Comment on such an act of faithlessness would be unnecessary: had they invaded Yassin, such an act would have been fatal to the whole Pamir expedition. The Yassin people could but have connected my presence there with the aggressions of the Dogras. I left Gilgit on the 21st March, leaving my camp, horses, &c., there, and have come down double marches. We were delayed five days, the Astor side of the Boorzil Pass, waiting for the weather to clear, but crossed the pass without any accident, although we had to march waist-deep through the snow for fifty miles. We passed three nights on the snow; and further than suffering from snow-blindness, caused by the intense glare of the sun on the new snow, were fortunate in crossing a pass said to be impracticable until May. I stayed three days in Srinagur, and came down to Murree in four days from there, just too late to see the Viceroy in Rawul Pindee. I have now just returned from Pindee, and, after seeing Lord Mayo here, to-morrow hope to get away from Kashmir at once. I should be back in Yassin, and on the Pamir by the end of June at latest. The Yassin chief has promised to assist me, will even send a party of his followers with me as a protection against the Kirghiz, if I wish it. Loading up supplies for a three months' campaign at Yassin should ensure success, and I feel very sanguine of thoroughly exploring the Pamir during the summer of 1870. It was most tantalizing to get to the foot of the Darkote Pass to know that the commencement of the Bâm-i-Dooneah (Roof of the World) lay just beyond the pass, and to be unable to get there yet on account of the snow.

"I have always been of opinion that the true road from India to Yarkand is from Peshawur *viâ* the Chitral Valley, or from Kashmir *viâ* the Yassin and Gilgit valleys, and not over the Karakoram range. I am more than ever inclined to uphold the opinion since I have seen the excellent road up the Yassin Valley. The geographical features which I have discovered may be said to be comprised in the following details. I have explored nearly all the valleys in the basin of the Gilgit and Yassin rivers, the watershed between Wakhan and Sarikol *i. e.*; the eastern crest of the Pamir lies from 60 to 70 miles more to the eastward than as given in our maps; the passes at the head of the Karambar and Yassin valleys lead over into the basin of the Oxus and not into that of the Yarkand River, or the Sarikol district. The Yassin River rises in three branches, the most easterly one in the Darkote Pass, the other two at the head of the Daspur and Moshabur valleys. Below Yassin

the Ghirzah River, rising in the Shundur Pass (leading to Mastuch and Chitral), comes down past Shevare; this stream also receives two considerable tributaries—one from the head of the Swat Valley, the other down the Baltibur Valley—up which lies a road leading to the country of Tangir. The united stream flows to the E.N.E., past Roshan, and then suddenly turns to the south-east. Above Gahkuch the Ishkaman River joins down the Karambur Valley, up which, at five days' journey distance, is the most easterly pass leading over into Wakhan or the basin of the Oxus. It appears there is a large lake at the head of this valley, which has been formed by glaciers falling and blocking up the valley. An immense amount of water has accumulated, and the inhabitants fear that, should a very hot summer ensue, the lake may burst its bounds through the glacier melting, and cause much destruction in the Gilgit Valley. An inundation from a similar cause took place nine or ten years ago, the lake bursting its bounds, and the marks of the devastation then caused are still distinctly visible in the valley. I believe the destruction of the cantonment of Nowshera may be traced to this cause, the water brought down through the Gilgit Valley having flooded the Indus and driven the Sunda River back up its bed. The Indus itself has a course of 20 to 25 miles more to the northward than delineated in our maps: after turning westward below Boonji, the streams it receives between Boonji and Balakote on its right bank are the Dilial and Tangir rivers, which countries lie between Gilgit and Swat; the Dilail River joins the Indus two days' journey below Chilas; the Hunza-Nagar stream joins the Gilgit River four miles below that place, its two chief branches rise in the Shingshal Pass and at the head of the Garmasai Valley. Yassin I found to be in lat. 36° 22′ 38″ N., long. 73° 35′ 15″ E., and 7765 feet above the sea. There are some fine snowy peaks, varying from 21,600 to 22,400 feet above the sea, in the Moshabur ridge between the heads of the Mastuch or Chitral and Yassin valleys. I have had some capital sport in Yassin. Ibex of 54, 45, and 44 inches, as well as markhor of 56, 52½, and 42½ inches, are the best heads I have secured. The Kashmir shooting cannot be compared with the sport met with across the Indus. The Pamir Steppes swarm with game, amongst which are the gigantic 'ovis poli,' the largest species of wild sheep in Asia. No European, I believe, has ever killed one. By the way, I met a servant of yours going into Kashmir, and from what he said I presume that you are going on leave again to Kashmir this year. I hope to get back there before Mr. Forsyth and Dr. Cayley leave for Ladak. I am afraid the Yarkand trade has been very much exaggerated,

and will not fulfil the expectations formed of it. The exports are very insignificant, although the Yarkandies would take Manchester goods in large quantities from India. I must not forget to mention that Colonel A. Gardner was inquiring most anxiously about his route-map and notes, which he said were in your hands, and hoped I might be able to take some answer about their publication back to him. He is of opinion that the Chang-chenmo route is a mistake, and a much better road is available by the Chitral or Yassin valleys. After seeing the country, I am inclined to second his opinion. The Yassin route is everything to be desired. There are no difficult passes met with except the Chichilih Pass in Sarikol district, and supplies are everywhere obtainable; but after exploring the Pamir I shall be able to ascertain every detail of this route. Mr. Forsyth, you will be aware, is going to Yarkand. There can be no danger to the mission as long as the Atalik Ghazee is alive and in power, but I doubt the members of the mission being allowed to go about when and where they please. As to going on to Khokand, the Atalik Ghazee will not hear of it for one moment. If he would allow exploring, Kashgar would be a splendid basis from which to attack the Pamir. If no disturbances have occurred in Gilgit, that now is the best road, but it will be impossible to visit Chitral and the Pamir too. If going home through Russian territory is given up, a return through Chitral might be ventured on; but Chitral, at the best, is dangerous ground: indeed, if the envoy from Chitral has got no satisfactory answer from Colonel Pollock, and has gone back, believing the British Government will not interfere to prevent further aggressions on the part of the Maharajah of Kashmir, it would be folly for an Englishman to enter that country. If I can get on from Yassin and cross the passes with supplies sufficient for the onward journey, I should endeavour to make the Russian frontier; where once arrived, a favourable reception should be a certainty. I must ask you to excuse a hurried note as I am much pressed for time, and

"I remain,

"Yours very truly,

"GEORGE W. HAYWARD."

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4. LETTER FROM MR. G. W. HAYWARD TO COLONEL SHOWERS.

"MY DEAR COLONEL SHOWERS, "Srinagur, 8th May, 1870.

"I have just reached here, and received your letter of the 2nd instant, forwarded from Murree.

"I had a very satisfactory interview with Lord Mayo, and am anxiously awaiting the result of the arrangements with the Maharajah at Sealkote. I am afraid there will be no resident (permanent) in Kashmir as yet, or anything said about giving up Gilgit; but all aggression for the future will, I am sure, be strictly forbidden. By crossing the Indus, the treaty of 1846 with the British Government has been most signally infringed. I have written to Colonel Pollock, the Commissioner of Peshawur, to ascertain the result of the visit of the vakeel sent by Aman-i-Moolk, the Chitral chief. It is of vital importance to the success of my expedition, and indeed my own safety, to know exactly what ideas he went back with. If the Chitral ruler thinks he will receive justice at the hands of our Government in the matter of the aggressions of the Dogras, no doubt an Englishman would meet a favourable reception in Chitral, otherwise it would be folly to enter the country. However, about the letters, as my maps and reports cannot be ready for some days, I should be glad if you would send them at once to Sir Roderick. I am, of course, writing privately to Sir Roderick and Sir Henry Rawlinson, but have some hard work to do yet before my maps and reports are ready. It has been most gratifying to me to hear that the Geographical Society's Gold Medal has been awarded me for the Yarkand trip. By the way, General Kaufman has been instructed to receive me well in Russian Turkistan if I succeed in getting through the 'terra incognita' of the Pamir Steppe; having got the Yassin chief on my side should ensure that success. I will write and let you know my exact movements before leaving Kashmir, and in the mean time

"I remain,

"Yours very truly,

"GEORGE W. HAYWARD."

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5. LETTER FROM MR. G. W. HAYWARD TO SIR RODERICK I. MURCHISON.

"MY DEAR SIR RODERICK MURCHISON, "Kashmir, 21st May, 1870.

"A former letter of mine will have made you acquainted with the fact of my return to Kashmir from Yassin and Gilgit. The abominable treachery and bad faith of the Maharajah of Kashmir's officials in Gilgit rendered such a step on my part positively necessary to ensure my own safety. Under the dread of an *exposé* of the atrocities they have committed across the Indus, the Dogra officials had evidently planned a systematic

scheme to injure me, and mar the success of my expedition. Thinking I was still in Yassin and sure to have become acquainted with all the facts of their misdeeds, or perhaps imagining I had been enabled to go on and cross the passes into Chitral or Wakhan, they caused a report to be spread that I had been plundered in Yassin, and, *professedly* to aid me, were on the point of again invading that territory, when my unexpected return to Gilgit arrested them.

"I had been more than suspicious of the sincerity of their goodwill, and when I found the passes beyond Yassin were closed by the snow, and likely to be impracticable for some months, I at once decided to return to Gilgit and wait for the proper moment to advance. My sudden return fully exposed the intentions of the Dogra officials. The treachery they meditated was so palpable as to be quite unmistakable. An invasion of Yassin whilst I was in that territory could not have been otherwise than fatal to the whole of my party, for the Yassin chief and his followers would instantly have connected the aggression with my presence there, and in the heat of the moment would have vented their indignation and anger on myself and party. Leaving my camp in Gilgit, I hurried down to Kashmir and the Punjab for the twofold purpose of making every arrangement to avail myself of the favourable opening to the Pamir Steppe, offered by means of the friendship established with the Yassin people, and of representing the facts I had become acquainted with. I have accordingly sent off baggage-animals and supplies for a summer's campaign to Gilgit, and am following, myself, in a few days. I hope to reach Yassin in 22 days from here, and should be on the Pamir Steppe in five weeks from this date.

"I regret, however, to have to tell you that a letter of mine representing the atrocities committed by the Maharaja of Kashmir's troops in the countries across the Indus, with an account of their massacre of the Yassin villages in 1863, and certain comments and opinions expressed thereon, has been published in the 'Pioneer' newspaper of May 9th. The publication of this letter is most unfortunate; and likely to interfere very much with the objects I have in view. I extremely regret that the editor of the paper in question should have thought fit to publish this letter, and the publication of it has been entirely in opposition to my wishes and instructions, while certain comments in the letter were never for one moment intended to be published in the form in which they appear in the 'Pioneer' of May 9th. The resentment aroused amongst the Maharaja's officials is very great, and it

cannot be doubted they will in every way *secretly* strive to do me harm.

"Still, in the interests of geography, I feel myself bound to persevere in the enterprise; and notwithstanding I have been strongly advised to postpone my journey, and am very loth to think of allowing myself to be diverted from the undertaking by any increased danger incurred through the resentment of the Kashmir Durbar.

"In order, however, to relieve the Royal Geographical Society from a shade of responsibility on my account, I deem it right to offer to sever all connection with the Society during the expedition I am contemplating; and though the severance of a connection so auspiciously begun will be a source of the profoundest regret to me, I am aware that before I left London it was distinctly understood that this exploration was undertaken solely at my own risk and on my own responsibility.

"However, all things considered, the prospect of success looks very fair indeed, after I shall have once reached Yassin again. Whatever resentment the Kashmir Durbar may entertain, the very fact of its being known should prove my greater safety; for the Maharaja is thus, as it were, responsible for the safe progress of the expedition.

"I am the more unwilling to give up the enterprise, from the mission of Mr. Forsyth to Yarkand; as, if able to open out the shortest and best route from British territory into Eastern Turkistan—that from Peshawur *viâ* the Chitral Valley and the Pamir Steppe—it will undoubtedly be a great step, and it is for the sake of the scientific and geographical information expected as the result of my journey that I have determined to adhere to my original purpose.

"Forewarned in this case is forearmed, and, notwithstanding all there will be to contend with, I firmly believe that (D.V.) success will ultimately attend my efforts, and carry through the enterprise in safety to the end.

"I remain, yours very sincerely,

"GEORGE W. HAYWARD."

Two months after the date of the preceding letter, Mr. Hayward was brutally murdered, as announced by Sir Henry Rawlinson in the 'Proceedings' of the Society, November 15th, 1870. The following letter gives a reliable account of this lamentable occurrence:—

LETTER FROM MR. FREDERICK DREW TO SIR RODERICK MURCHISON, ON THE DEATH OF MR. HAYWARD.

"Jummoo, near Sealkote,
"21st Dec. 1870.

"MY DEAR SIR RODERICK MURCHISON,

"I am sure you will be anxious to learn all that can be known about Mr. Hayward's death; and I am glad to be able to give you some particulars that probably have not yet reached you. I was in Baltistan when the news of the event which has caused so much regret to all Mr. Hayward's friends, among whom I count myself, reached the Maharaja of Kashmir, and he sent orders for me to go to Gilgit, and make a thorough investigation into the circumstances: this I did to the best of my power, and have just now returned to Jummoo. I wrote a full report of all I could learn, which report the Maharaja has sent to the Lieut.-Governor of the Punjab, so it may reach you through Government; still I am desirous to let you know the result of enquiries in Gilgit without any delay.

"No doubt Mr. Hayward gave you a full account of his first journey to Yāsīn; you will therefore have heard of the friendly way in which Mīr Wallī received him that first time, and will have seen how completely Mr. Hayward believed in him. Those more used to the two-facedness and the avarice of the people of those parts—developed to an extreme in their rulers—doubted the sincerity of Mīr Wallī's friendship, and saw cause enough for his civility in the presents given and in his hope for more afterwards, as well as in the wish that he had to make a political use of Mr. Hayward. I did not meet Mr. Hayward between his two journeys to Yāsīn—having missed him at Sirinagar by but a day; but I heard from him by letter, and heard from others, of much that he had experienced. It was clear that he had put away from him all fear of the Yāsīn people, and was most sanguine of the success of his expedition.

"As all details of his last journey will be welcome to you, I will now give the particulars I learnt.

"Mr. Hayward reached Gilgit on the 7th July, and left it for Yāsīn on the 9th; he had much more baggage than on his first journey—then fourteen coolies carried the camp, now thirty-three were required,—and he had these servants:—a munshi, a khansaman (Kashmiri), a chuprasi (Kashmiri), and two Pathāns, whom he met and took into his service at Gilgit. I believe that he reached Yāsīn in five days, that is, on the 13th July.

"For what happened after his crossing the Maharaja's border, we have evidence of various degrees of trustworthiness. There is the statement of Wazīr Rahmat, a former acquaintance of mine, who was Mīr Wallī's wazīr, but who, after the murder, fell away from him, and compassed his expulsion from Yāsīn. This we have in two forms—by a letter and by word of mouth from an agent he sent in to Gilgit; then there are some letters written to us by Imān-ul-Mulk, Raja of Chitrāl; and again there is the information got by messengers whom we sent to Yāsīn. From these materials a connected view of the last events in Mr. Hayward's life can be made out, and one which, from the corroboration of statements derived from various sources, deserves, I think, considerable confidence.

"Wazīr Rahmat says, that on Mr. Hayward approaching Yāsīn, Mīr Wallī went some miles out to meet him, and, on coming within hail, got off his horse; but that his visitor did not pay the same respect, but remained mounted till quite near, and that Mīr Wallī was somewhat offended at this. We have

no corroboration of this statement of Rahmat's, and if anything of the sort did occur, we may be sure that it was simply from Mr. Hayward not knowing what exactly was expected of him; nor is it likely that this of itself would have led to any serious consequences. Mr. Hayward pitched his camp in Yāsīn, and stayed there two days, Mīr Wallī coming twice or thrice to visit him within that time. During one of these visits, Mīr Wallī asked what had been done in the matter of getting his right—or supposed right—to Gilgit recognised by the Governor-General, for which purpose he had sent an agent to the Punjab, in company with Mr. Hayward. Nothing having been effected in this (the agent himself not having stayed to prosecute the suit), Mr. Hayward could not give any answer that would be satisfactory to people unused to the delay necessary for careful investigation and consideration. Mīr Wallī, it seems, had built much hope on Mr. Hayward having originally undertaken to represent his case, and was proportionally disappointed at nothing having resulted from it.

"Then we hear, through Rahmat, that Mr. Hayward asked for coolies to carry his camp to Badakhshān by the straight road, while Mīr Wallī desired him to take the way to Chitrāl, whence he might be passed on by the Chitrāl Rāja. It seems that the Rāja of Chitrāl had given orders for him to be sent on to him. Certainly he wished to see him; and on this occasion Mīr Wallī (who had on the first visit dissuaded him from going there) pressed him to go there, probably thinking it better that the Englishman should go to Chitrāl and part with his goods there than pass altogether out of the family territories,—or perhaps he had, since the first visit, received such orders about this as he dared not disobey. This argument between the two was conducted with a good deal of warmth. The accounts say—but I am unwilling to believe them—that Mr. Hayward called Mīr Wallī by a hard name that he was likely to resent. However, Mr. Hayward kept to his purpose (which was to go by as straight a road as possible to Pāmir), and Mīr Wallī gave in and provided coolies; and probably then only, when he saw the coveted goods going out of his reach, formed the design against Mr. Hayward's life.

"The progress of the camp was slow: the marches made were—Sandī, 3 miles; Hundar, 5 miles; Darkūt, 6 or 8 miles. It is not unlikely that delays were purposely interposed; at the same time it must be remembered that carrying heavy loads is by no means a practice in that part of the world, and the coolies very likely refused to go beyond their own bounds, and so caused delay too. I reckon that Mr. Hayward's camp reached Darkūt on the afternoon of the 17th July.

"Mīr Wallī having made up his mind to plunder and murder his guest—the man who had done his best to serve him—sent Shāh Dīl Imān, one of his relations, and Kūkalī, a man well known in Yāsīn, with, some say, as many as sixty men. These reached Darkūt in the evening of the same day that saw Mr. Hayward arrive there; and the collection of so many in a small village aroused attention, and—although Shāh Dīl Imān said he had been sent to see Mr. Hayward safe over the Pass—even suspicion. There had been yet another cause for doubt in the mind of Mr. Hayward, in some words which Mīr Wallī had let fall to one of the Pathans, when trying to persuade him to leave his master's service; so much influence had these doubts on Mr. Hayward that he sat up all that night prepared, expecting an attack. The headman of the Darkūt village describes him as sitting in his tent, with the candle burning, with guns ready on the table before him, and writing, but in his left hand holding a pistol. No doubt, he thought that if he could tide over the danger of this night he might escape free, for close in front of his camp was the ridge, the boundary of Mīr Wallī's country, which crossing in the next march he would have reached Badakshān territory, out of reach

of Mīr Wallī's treachery, and have had new countries before him to find his way through.

"It was not, however, to be. The watch kept certainly deterred his enemies from an attack during the night; but these people are masters in the kind of warfare that consists in surprises: they waited their time, and when, by sunrise, Mr. Hayward, thinking all danger over, lay down to take an hour's rest before the day's march, their opportunity had come. The position of the camp helped their design: it was at a little distance from the village, in a small garden at the edge of a thick pine-forest; in this they could collect their men, and even stand them near to the tents without observation. It seems that they did this on finding out that the object of their wiles was asleep, and then Kūkalī entered the tent with a rope, picked up from among the baggage, and while others came on and held in check and bound the servants, he, aided by more, seized Mr. Hayward and bound his hands behind him; and then they led both him and his servants away from the camp into the forest, for the distance of a mile or more, Mr. Hayward on the way offering them a ransom for his life. When they had come that distance they stopped, and Shāh Dīl Ilmān, drawing his sword, cut him down with a blow on the neck that must have killed him at once; and this was while he was in the act of saying a prayer. At the same time four out of the five of the servants were killed close by; the bodies were covered up with heaps of stones, and so left.

"The evidence of most of this that has been recounted comes from two separate and independent sources: first, Wazīr Rahmat's letters, and the statement of the agent present; secondly, the account of the head-man of Darkūt, given to Gufār Khan, our sepoy, who went to that place afterwards. That, however, you may understand how it was that we received these accounts, I must tell next what occurred in Yāzīn.

"Wazīr Rahmat was not in the murder, and he says that he tried to dissuade Mīr Wallī from it. Now Mīr Wallī designed, first of all, to keep the whole thing a secret from the Maharaja's authorities and the British, and in Rahmat he saw a channel by which the news might ooze out; it was natural, too, that he should be incensed at his wazīr being less guilty than himself: hence he designed to kill him. But in Rahmat he met his match. Getting private news of the plot, he sent his son to Mastūj, the Rāja of which place was Pahlwān Bahādur, who equally with Mīr Wallī was tributary to the Chitrāl Rāja; there a scheme was made to displace Mīr Wallī, and, with the consent of Raja Iman-ul-Mulk, Pahlwān Bahādur brought a force of 500 men to Yāsīn before Mīr Wallī had time to prepare a resistance; so he fled away by the Darkūt road, and Pahlwān Bahādur reigns in his place with Rahmat as wazīr.

"Mr. Hayward's munshī, who had been kept prisoner up to this time, was killed by order of Mīr Wallī, when on his flight he reached the same village of Darkūt.

"No sooner was the new state of things established than agents came to Gilgit to apprise the Maharaja's officials of the change, saying that Rāja Iman-ul-Mulk had deposed Mīr Wallī in punishment for his having murdered an Englishman. The agents from Chitrāl and Yāsīn were in Gilgit when I reached the place. Rahmat's special messenger I at once sent back, having got from him (not without taking advantage of his natural cupidity) a promise that he would send in Mr. Hayward's body; with him I sent Gufār Khān, who went to the place of the murder, uncovered all the bodies from the loose stones, buried on the spot those of four of the Muhammadans who had been killed, the fifth not being found, and brought Mr. Hayward's body into Gilgit, where it reached me on the evening of the 26th October. The next morning we

buried him in a garden near Gilgit Fort. A detachment of troops fired three volleys over his grave.

"I think you will be glad to hear that the Maharaja has promoted Gufār Khān to the rank of Jemadar, and has otherwise rewarded him.

"They at the same time gave over to Gufār Khān a few of Mr. Hayward's goods, declaring that the rest were taken away by Mīr Wallī in his flight. Those we recovered will be made over to the Punjab Government: they include some books, loose papers, and maps. The papers I looked over, to see if anything were written that might give help in finding out the cause of the murder, but there was nothing of late date.

"You will like to know the last news of Mīr Wallī. He was pursued as far as the Darkūt Pass, but got away, with the loss of a few followers, to Badakhshān; soon afterwards, however, he turned from there, and came to Chitrāl and asked forgiveness of the Rāja, and he has so far received it that he is now allowed to live there. We have sent back the Chitrāl Vakeel with a demand that he should be given up; but it is hardly likely to be agreed to, though Iman-ul-Mulk may insist on his leaving Chitrāl. There are few places where he would be safe from the influence both of the British Government and of the Maharaja; but one there is—Swāt, and there I think it likely he will take refuge.

"Mr. Hayward's death produced much regret among all who had met him—I speak of the people of the countries he had lately passed through. Many were the enquiries made of me as to the truth of the reports of it that had spread, and deep was the pain which my answers caused. All who had had intercourse with him took pleasure in praising him for his courage and energy and for his pleasant manners.

"The Maharaja desires me to say that if any of Mr. Hayward's friends or the Royal Geographical Society desire an inscription to be placed over his grave, and will communicate it, he will be glad to have the tablet executed in India, and will direct that the stone be properly placed. I put a wooden cross at the head of the grave till something else should replace it.*

"Believe me to be sincerely yours,

"FREDERICK DREW."

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* The Council of the Royal Geographical Society have availed themselves of this offer, and a suitable inscription, drawn up by Sir Henry Rawlinson, was sent, through Mr. Drew, to the Maharaja, who ordered the erection of the monument.—[ED.]

APPENDICES TO MR. HAYWARD'S LETTERS.

VOCABULARIES OF THE DIALECTS OF DARDISTAN, WAKHÁN, SHIGNÁN, AND ROSHNÁN.

English.	Gilgit, Chilis, Dilail, &c.	Hunza and Nagar.	Yassin.	Chitrál.
1.	Ek.	Hun.	Hun.	'Ih.
2.	Dú.	Altazh.	Altun (altazh).	Ju.
3.	Cha.	Usko.	Usko.	Tro, i.
4.	Chár.	Walto.	Walto.	Chor.
5.	Po, ye.	Tsundo.	Tsundo.	P'oonj
6.	Shú.	Mishindo.	Mishindo.	Cho, i (T'choi).
7.	Sát.	Thúla.	Thúlo.	Sot.
8.	Atch.	Altambo.	Altambo.	Usht.
9.	Now.	Hun, chu.	Hun-chu.	Nú (uyú).
10.	Dai.	Toram.	Toram.	Zhesh.
11.	Ek, ai.	Torma-hun.	Torma-hun.	Zhesh-ih.
12.	Bai.	Torma-Altazh.	Ditto ditto.	Zhesh-ju.
13.	Cho, í.	Torma-Usko.	Ditto ditto.	Zhesh-tro, i.
14.	Choudai.	Torma-Walto.	.. .. ..	Zhesh-chor.
15.	Pauzai.	Torma-tsundo.	Torma-tsundo.	Zhesh, poonj.
16.	Shu, i.	Ditto &c.	Ditto &c.	Ditto &c.
17.	Sat, ai.	Ditto &c.	Ditto &c.	Ditto &c.
18.	Atch, ai.	Ditto &c.	Ditto &c.	Ditto &c.
19.	Quin, ai.	Ditto &c.	Ditto &c.	Ditto &c.
20.	Bee.	Althar.	'Althar.	Bishír.
21.	Bee-ek, &c.	Althar-hun.	'Althar hun.	Bishír 'ih, &c.
30.	Bee-dai.	Althar toram.	'Althar toram.	Bishír Zhesh.
40.	Dú-bee.	Altazh Althar.	'Altazh althar.	Ju bishir.
50.	Du-bee dai.	Altazh Althar Toram.	'Altazh Althar toram.	Ju bishir zhesh.

60.	Cha, bee.	Usko althar.	Usko althar.	Tro, í bishír.
70.	Cha bee dai.	Usko althar toram.	Usko althar toram.	Troí bishír zhesh.
80.	Chár bee.	Walto althar.	Walto althar.	Chor bishír.
90.	Char bee dai.	Walto althar toram.	Walto althar toram.	Chor bishír zhesh.
100.	Shal.	Thá.	Thá.	Shor.
1000.	Sás (sáus).	Sás.	Sás.	Hazár.
Anybody.	Ji.	Khá.	Menan.	
Anything.	Jik.			
And.				
As.				
Another.	Mútú.	Túman.	Túman.	Khúr.
Air.	Osh.	'Ai-esh.	Tish.	Asmán (?).
Awake.	'Utyo.	Destul.	Destul.	
Aunt.	Baba Sú.	Aya, es.	Aya, es.	
Apricot.	Phutar.	Batúring.	Batúring.	Chambúr.
Arm.	Shá, ko.	'Ashák.	'Ashak.	Bázu.
Arrow.	Konh.	Húnz (huntz).	Hunz.	Washú.
All.	Batap.	Kohesus.	'Aiyún.	Hamúni (hamooni).
Army.	Síu (seeng).	Hal.	Hal.	Bhol.
Assembly.	Gathí.	Butsús.	Gathí.	Ambo.
Anger.	Rosh.	Mos.	'Imos.	Kahrín.
Annoyance.	Damíjár.	.. ..	Damíjár.	
Aim.	Nazar.	Nazar.	Nazar.	Nazar.
Ask.	Kojago.	Dogacasan.		
Answer.	Jawáb.	Jawáb.	Jawáb.	Jawáb.
Ass.	Jakún.	Jakúyo.	Jakúu.	Gúrdogh.
Arrange.	Bandobast.	'Achoban.		
Below.	Kiri.	Yára.	Kata.	'Af.
Between.	Mujja.	Haran, ullu.	Mákuchi.	Múja.
By.	Gi.			
Bow.	Dánu.	Jamma.	Jáma.	Drún.
Bird.	Chá, in.	Chín, h.	Chin, h.	Bo, ík.
Blood.	Lel.	Múlthun.	Múlthun.	Lé.
Boat.	Nau (naw).	Nau.	Kishti.	Kishtí.
Bone.	'Utti.	Tiu.	Tiu.	Kol.

VOCABULARIES OF THE DIALECTS OF DARDISTAN, WAKHÁN, SHIGNÁN, AND ROSHNÁN—*continued*.

English.	Gilgit, Chilás, Dlial, &c.	Hunza and Nagar.	Yassin.	Chitrál.
Bridge (rope).	Gal.	Gal.	Gal.	Tili, siri.
Bridge (wood).	Sa, ou.	Bash.		
Bad.	Kachu.	Ghunakish.	Shúm.	Dish.
Bitter.	Chúruko.	Shokaram.	Shút.	Shút.
Black.	Kinho.	Mattám.	Mattám.	Shá.
Bring.	In, ati.	Kol, ditzo.	Kol, azo.	Yú ra augìr.
Be silent.	Chúk, ta.	Chúk, heta.	Chúk, hetah.	Phigbos.
Brother.	Jhá (jáh).	Acho.	Acho.	Brár.
Bridle.	Gapi.	Taban.	Tamang.	'Ivis.
Box.	Sandúk.	Sandúk.	Sandúk.	Sandúk.
Book.	Kitáb.	Kitáb.	Kitáb.	Kitáb.
Barley.	Yo.	Hari.	Haray.	Síri.
Butter.	Ghí.	Maltush.	Maltash.	Douh.
Back.	Pito.	'Awaldas.	'Awaldas.	Krim.
Breast.	Tetero.	'Audil.	Díling.	Paz.
Beginning.				
Bed.	Khat.	Khat.	Shau.	Jhen.
Beard.	Dai, e.	'Auyar.		Rigish.
Birth.	Júlo.	Dima, nimi.	Dima, nimi.	Ajistai.
Buy.	Ginoki.	Yanus.		
Cat.	Búshi (booshi).	Boosh.	Boosh.	Pooshi (púshi).
Cow.	Gao.	Bú, ú.	Bí, a.	Leshu.
Crow.	Káu.	Gháu.	Ghúmún.	Kágh.
Cold.	Sor.	Shagoram.	Shagoram.	'Usháh.
Crooked.	Kola.	Gauda.		
To come.	In, awá.	Kol, ru.	Kol, azho.	Yú raghír.
Cousin.	Baba jáwi púch.	Aya úcho, í.		
Custom.	Mirús.	Chol.	Dastúr.	Dastúr.
Choice.	Khush.			
Cheap.	Bodo.	Bút.		
Carpet.	Batári.	Batári.	Jhíl.	Jhíl.

City.	Shahr.	Shahr.	Búshai.	'Aulat.
Cowardice.	Bí, jato.	Bíjato.		
Clean.	Pák.	Pák.	Bat, pagza.	Bat, pagza.
To cook.	Reni, go.	Desiri, miu.	Distera.	Pachúna.
Cotton.	Ki, as.	Kí, as.	Kapás.	Didous.
To cherish.				
Complaint.	Faryád.	Faryád.	Kawet.	
Camel.	'Unt.	'Unt.	'Ut.	'Ut.
Cloudy.	'Ajo.			
Copper.	Ril.	Ril.	Sh, kark.	Dúrúm.
Cloak, chogha.	Shoka.	Shoka.	Shúka.	Shúka.
Day.	Déz.	Gúntz. '	Gúnz.	'Anús.
Dog.	Shu.	Húk (hook).	Húk (hook).	Réhni.
To drink.	Pí.	Míni.	Míni.	Pia.
Daughter.	Dí.	'Ai.	'Ai.	Júr.
Darkness.	Tatang.	Tatang.	Tútang.	Chú, i.
Desire.	Búyet.	Búyet.		
Door.	Dar.	Hing.	Hing.	Du, art.
Distant.	Dúr.	Matán.	Matán.	Dú, diri (doodeeri).
Death.	Mú.	'Irami.	Mo, yaru.	Obistai.
Defeat.	Fóti.	Fóti.	Galjain.	'Uchistáni.
Difficult.	Zor.	Zor.	Mushkil.	Mushkil.
Ear.	Kóu.	'Iltamal.	'Altamal.	Kar.
Earth.	Suin.	Tik.	Tik.	Chúti.
Egg.	Hanay.	Tingan.	Tingan.	Ai, ekan.
Elephant.	Hasto.	Hasto.	Fil.	Fil.
Eye.	'Achi (átchi).	'Alchamatz.	'Alchi.	Ghech.
To eat.	Khú (h).	Shí.	Shí, a.	Uayastam.
End.	Phash.	Phash.	Phash.	
Easy.	Asáu.	Asáu.	Askau.	Askáu.
Far.	Dúr.	Matán.	Matán.	Drung, Dú, díri.
From.	-Jo.			
Fire.	'Agár.	Phu.	Phu.	'Angár.
Father.	Búba.	'Aya.	Tati.	Tat.
Flower.	Phaur.	Haskor.	Gambúri.	Gambúri.

VOCABULARIES OF THE DIALECTS OF DARDISTAN, WAKHÁN, SHIGNÁN, AND ROSHNÁN—*continued.*

English.	Gilgit, Chilás, Dilail, &c.	Hunza and Nagar.	Yassin.	Chitrál.
Foot.	Pá, e.	'A, outing.	'A, outing.	Púng (poong).
Fat.	Tholo.	Dagháno.	Daghána.	Thúl.
Flat.	Shílo.	Babar.	Rat.	Lasht.
Forehead.	Nilá, o.	'Afáti.	'Afáti.	Peshúni.
Finger.	'Angú, i.	'Unush.	Gúni.	Chámut.
Face.	Mukh.	'Ishkil.	'Ishkil.	Mukh.
Fowl.	Kárkámosh.	Kárkamosh.	Kárkamosh.	Kúhak.
Fort.	Kote.	Kan (kun).	Kan (kun).	Naghúr.
Family.	Aulád.	Aulád.	Kaum.	Kamyet.
Fear.	Biji, tai.	Biji, tai.	Gamal, cham.	Búltístai.
False.	Khaltay.	Ghaltamish.	Phaíng.	Changisún.
Forest.	Mushkh.	Mush, kh.	Mushkh.	Kach.
Feast.	Onus.	Onus.	Badshía.	Boyastam.
Go.	Bo.	Ní.	Néh.	Bogha.
Good.	Mishto.	Daltas.	Shuá.	Jam.
Great.	Buro.	'Uyum.	Ni, u.	Lat.
Green.	Nílo.	Shigam.	Ishkam.	'Uch.
Give.	Dah (dá).	Yú.	Yú.	Dhet.
Gun.	Tumak.	Tumak.	Tuhak.	Tuhak.
Grass.	Kach.	Shikar.	Pharo.	Shal.
Grape.	Jach.	Ghaí, u.	Ghai, u.	
Game, play.	Hálo.	Hálo.	Girasham.	'Ishtok.
Grain.	Kúlo.	Phalo.		
Grief.	Hesh-Fikr.	Hesh.	Gham.	Gham.
Gold.	Sóu.	Ginish.	Ghendish.	Soram.
He (she, it).	Ro.	'Iu.	Na.	Hes.
His.	Aísa.	'Iua.	Hasa.	Hatago.
Here.	'Ani.	Kolay.	Kho.	Hai, yara.
How much?	Kachák.	Bairam.	Bairúm.	Kandúri.
How?	Kio.	Beltan.	Beltan.	Kia, kasan.
Hair.	Jekúr.	Wo, ung.	Wo, ung.	Phúr.

Hand.	Háth.	'Arín.	'Arín.	Host.
Hawk.	Báz.	Ba, yosh.	Gashanj.	Yurch.
Head.	Shish.	Yetis.	Yetis.	Sór.
Horn.	Singh.	Túr.	Túr.	Surung.
Horse.	Ashpo.	'Aghor.	Haghara.	'Istór.
House.	Gote.	Ilha.	'Hha.	Khatun.
Hunger.	'Unyár.	Chaminí.	Chaminí.	Chúi, yastam.
Handsome.	Minilya.	Bad, daltas.	Shua.	Jam.
To hear.	Kouda.	Galtamal, eta.	Galtamal, eta.	Ka, kori.
Heart.	Híyo, Jil.	Híyo, Jil.	'Us.	Hirdí.
Hermit.	Derbesh.	Derbesh.	Kalandar.	Kalandar.
Hard.	Kúro.	Danin.	Dang.	Dang.
Hunting.	Darú.	Darú.	Darú.	'Ishkár.
In.	'Aru.	'Ula.	'Ula.	'Adraini.
I.	Má.	Jha.	Jha.	'Awa.
Iron.	Chimr.	Chimr.	Chimr.	Chúmr.
Information.				
Insane, mad.	Yach, líto.	'Arago.	'Arago.	
Infidel.	Káfir.	Káfir.	Kafir.	Káfir.
Justice.	Isáf.	'Isáf.	'Insáf.	'Insáf.
Kill.	Mára.	'Eshkanan.	'Eshkanan.	Maristai.
Knife.	Khatár.	Chur.		
Knee.	Kato.	Anamús.	Anamús.	Zánu.
King.	Badshah.	Than.	Than.	Methar.
Little.	'Apu.	Phális.	Kam.	Kam.
Leaf.	Putha.	Túpung.		
Light.	Sang.	Sang.	Garí.	Rosht.
Long.	Jigo.	Ghasan, am.	Ghasan, am.	Drúngh.
Lift up.	Hun, ta.	Dal, eta.		
Lips.	'Ota.	'Iling.	'Iling.	Shun.
Leg.	Gúnh.	Pening.	Phatik.	Chuchu dek.
Language.	Bash.	Bash.	Zabán.	Zabán.
Level.	Samár.	Babur.	Rat.	Lasht.
Lake.	Sar.	Sar.	Pharí.	Chat.
Letter.	Khatt.	Khatt.	Khatt.	Khatt.

VOCABULARIES OF THE DIALECTS OF DARDISTAN, WAKHÁN, SHIGNÁN, AND ROSHNÁN—*continued*.

English.	Gilgit, Chilás, Dilail, &c.	Hunza and Nagar.	Yassín.	Chitrál.
Leather.	Chaín.	But.	Gup.	Gochu.
Lead.	Nang (núng).	Nang.	Hakin.	Haziz.
Mine.	Mai.	Jhá dila.	Jha bar.	'Awa sum.
Much.	Bodo.	Bhút.	Bhút.	Boh.
Man.	Mushá.	Hír.	Hír.	Mosh.
Moon.	Yun.	Haluntz.	Halunz.	Mas.
Mountain.	Chish.	Chish.	Chish.	Zúm.
Mother.	'Aja.	Mamí.	Naní.	Nan.
Mouth.	Aí.	Hakat.	Hakat.	'Apak.
Milk.	Dúdh.	Mámu.	Mámu.	Chír.
Morning.	Lashtáki.	Tsordi.	Tsordi.	Chuí, chí.
Misfortune.	Balai.	Pits, í.		
Medicine.	Bilain.	Milain.	Mila, hun.	Wez.
Meat.	Mos, maus.	Chap.	Chap.	Púshúr.
Marriage.	Shariyár.	Shariyár.	Khushaini.	Khushainí.
Male.	Bíro.	Bíro.		
Now.	Tain (Tein).	Múta.	'Amúta.	Hanísí.
Name.	Núm.	Gúyek.	Gúyek.	Núm.
Night.	Ráti.	Tap.	Táp.	Chu, í.
Near.	Kach.	Hasír.	Hasúr.	Sho, í.
Nephew.	Jawí-púch.	'Acho, í.		
Niece.	Jawá-dí.	'Acho, ai.		
Nose.	Nato.	Gumash.	Gumash.	Naskar.
Nostrils.	Nato, joli.	'Amal, tarin.	Bahang.	Bukh, h.
Nail.	Nuri.	'Uru.	'Uru.	Doghúr.
New.	Ná, o.	Tosh.	Tosh.	Nogh.
Notice.				
Our.	Aisa, hano.	Mí, bí.	'Ispa hasar.	
Ou.				
Outside.	Daru.	Holá.	Holá.	Bair, í.
Oil.	Tél.			
Old.	Parúno.	Parúno.		

Proof.	Majúno.			
Prisoner.	Budo.	Budo.	Bandi.	Bandi.
Poverty.	Náchári.			
Place.	Dish.	Dish.	Jajáh.	Jajáh.
Pit.	Galko.	Galk.	Ch, ha.	
Pretence.	Bahána.	Bahána.	Bahána.	Bahána.
Petition.	Buyet.	Buyet.	Kousish.	Kousish.
Plain.	Lasht.	Rat.	Rat.	Lasht.
Priest.	Akhoond.	Akhoond.	Akhoond.	Akhoond.
River.	Sin (Sind).	Sinda.	Sinda.	Sin.
Road.	Pón.	Gau.	Gau.	Póng.
Raw.	Amú.	Dághoi.	Dághoí.	Amú.
Red.	Lailo.	Bárdúm.	Bárdum.	Kroi.
Ripe.	Pakau.	Digoui.	Digoui.	Púchistai.
Round.	Bidíru.	Bidíru.		
Rice.	Birí, u.	Biri, u.	Gring.	Gring.
Rock.	Batt.	Dau.	Dau.	Búrt.
Ring.	Baruno.	Baruno.	Barundu.	Palangashtu.
Remainder.	Phat, bilok.	Duá, sí.	Duá, sí.	
Roof of a house.	Tesh.	Tesh.	Sholt.	Istán.
Ready.	Taiyár.	Taiyár.	Taiyár.	Taiyár.
Robber, thief.	Chúruto.	Ghin.	Ghin.	Chog.
Rain.	'Ajho.	Haralt.	Barsát.	Waru.
Return.	Ba, álo.	Dádími.	Dádí, a.	Baga, hai.
Rafter.	Bo, yí.	Sinchko.	Sauj.	Sangír.
Salt.	Baju.	Bai, yu.	Bai, yu.	Trúp.
Skin.	Cham.	Bat.	Gap.	Post.
Sky.	'Agai.	Bhot.	Haiyesh.	Asmán.
Star.	Túra.	Hasí.	Hasúman.	'Istári.
Snake.	Jhim.	Tal.	Thal.	'Ai, í.
Sun.	Súri.	Sá.	Shá.	Yúr.
Stone.	Batt.	Dau.	Dau.	Búrt.
Short.	Katu.	Chat.	Chat.	Blatz.
Straight.	Súnchu.	Tsan.	Tsan.	Húrk.
Small.	Chúno.	Jhat.	Hachogan.	Tsak.
Sweet.	'Ispá, o.	'Uyam.	'Uyam.	Fristam.

VOCABULARIES OF THE DIALECTS OF DARDISTAN, WAKHÁN, SHIGNÁN, AND ROSHNÁN—*continued.*

English.	Gilgit, Chilás, Dihall, &c.	Hunza and Nagar.	Yassin.	Chitrál.
Be silent.	Chukta.	Chuk, heta.	Chuk, heta.	Phigbos.
Sit down.	Bai.	Harút.	Harút.	Nishi.
Sleep.	Sao.	Guchá.	Guchá.	Pori.
Stand up.	Humbo.	Dúlmana.	Dúl, mana.	
Speak.	Rhá.	Sen.	Sen.	Rhá.
Strike.	Déh.	Díla.	Díla.	Dit.
Son.	Púch.	'Ayi.	'Ayi.	Ja, ou.
Saddle.	Tilain.	Tilain.	Tila, hun.	Hún.
Stirrup.	Kai.	Kai.	Kaha.	Alghan.
Sabre.	Khangr.	Gataneh.	Gataneh.	Khúngr.
Sign.	Haiyún.	Haíyún.	Haiyún.	Nishán.
Stage.	Bas.	Basah.	Basah.	'Eb.
Send.	Chima, gas.	'Airam.	'Airam.	
Slave.	Maristan.	Máristan.	Máristan.	Rohí.
Smell.	Gún.	Nas.	Nas.	Wai, goeu.
Share.	Bargo.	Bargo.	Phákiu.	Bajúr.
Sick.	Ragoto.	'Urgot.	Awalam.	Chai, ek.
Stranger.	Logo.	Jai, ip.	Begúna.	Nojau.
Sickness.	Ghulis.	Ghulis.	Awalamkish.	Chai, eki.
Search.	Looko.	Hamal, kúm.	Talash.	Talash.
Spectacle.	Hai.	Tamasha.	Tamasha.	Tamasha.
Swift.	Teino.	Teino.	Tez.	Tez.
To seek.	'Odoroki.	'Odoretus.		
Silence.	Chúk.	Chúp.	Lanat.	Phigbos.
Shield.				
Soft.	Má, ou.	Mo.	Flash.	Flash.
Staff.	Kamúli.	Darago.		
To sell.	Gá, digar.	Gashat.	Gashat.	Be, zamistai.
Silver.	Rúp.	Rúp.	Buri.	Darokham.
Shoes.	Pizár			Kafsha.
Snow.	Hin.	Ghá.	Ghá.	Hím.
Straw.			Ishka.	Jash.

Sheep.	'Ajûla.	Hunyes.	Bilas.	Kohrí.
Thou.	Tú.	'Ung.	'Ung.	Tu.
They.	Rí.	Aw.	Het.	Het.
Thine.	Tai (thaí).	'Ung dilâ.	'Ung bar.	Tu, asas.
This.	'Ano.	Kas.	Gúta.	Haia.
That.	'Aw (áo).	Hes.	Tu.	Hes.
There.	'Adi.	'Ela.	Tola.	Hira.
Then.	Obel.	Heta.		
Thus.	Ada.	'Akil.	'Akhi.	
To-day.	Ash.	Kúlto.	'Akhúi.	Hanún.
To-morrow.	Lushtúki.	Jimden.	Gúnchut.	Chuchí.
Tiger.	Dí.	Táh.	Táh.	Phardun.
Tooth.	Doni.	'Ama.	Gúma.	Doú.
Tree.	Tam.	Joug.	Dirakht.	Dirakht.
Tall.	Jigo.	Ghusanam.	Ghusanam.	Drúngh (droong).
Thin.	Taluno.	Giligin.	Giligin.	
Take.	Lám.	Hur.	Tsu.	
Throat.	Shoto.	Búk.	Gosh.	Gol.
Thigh.	Phatúlo.	Basuring.	Gultuns.	Dek.
Tongue.	Jíb.	'Unas.	'Ungas.	
Tent.	Gút.	Gút.		
Trouble.				
True.	Súncho.	Tsan.	Tsan.	Húrk.
Time.	Kha, en.	Kha, in.	Wakht.	Wakht.
Traveller.	Musafir.	Gharíb.	Musafír.	Musafír.
Tower.	Shikúr.	Shikár.		
Tomb.	Mazár.	Mazár.	Mazár.	Mazár.
Understand.	Dashtakí.	Haibá.	Gúnchat.	Pína, chui (doubtful).
Uncle.	Búba Jah.	'Aiya acho.		
We.	Bhi.	Mí.	Mí.	'Ispa.
Who?	Ko.	Menan.	Menan.	Ka.
What?	Jik.	Basan.	Basan.	Kashír.
When?	Kera.	Beshal.	Bashar.	(Kiawakt?).
Where?	Koni.	'Amallu.	'Amallu.	Kúra.
Why?	Jik (?).	Bo.	Basan.	Karí.
With.	Nula.	Nula.	Nula.	Cho.

VOCABULARIES OF THE DIALECTS OF DARDISTAN, WAKHÁN, SHIGNÁN, AND ROSHNÁN—*continued.*

English.	Gilgit, Chilás, Dilail, &c.	Hunza and Nagar.	Yassin.	Chitrál.
Within.	'Aru.	'Ula.	'Ula.	Adraini.
Without.	Dáru.	Holá.	Holá.	Bai, rí.
Water.	Wai (Uey).	Tsil.	Tsil.	'Ugh.
Weary.	Shamaras.	'Awaram.	'Awaram.	
White.	Shai, o.	Burúm.	Burúm.	Ishparo.
Weep.	Rahiú.	Harchabai.		
Woman.	Chai.	Gús.	Gús.	Kúmíri.
Wheat.	Gum.	Gúr.	Gúr.	Goum.
Window.	Durí.	Durí.		
Voice, sound.	Musho.	Kús.	Achúr.	Awúz.
Village.	Ku, i.	Búshai.		
Whip.	Túr.	Túr.		
War, battle.	Birgú.	Birga.	Jang.	Jang.
World.	Dunyát.	Dunyát.	Dunyú.	Dunyá.
Witness.	Chip, ji.	Chip, ji.		
To wash.	Dhojoki.	Yaltash.		
Wonder.	'Ajúno.	Thúm.	Akhish.	Najan.
Wine.	Mo.	Mel.	Mel.	Rhen.
Valley.	Gah.	Barkin.	Bar.	Gol.
Wood.	Juk.	Gashil.	Hún.	Dar.
Wild goat.	Bum, kail.	Ghiri.	Halden.	Tanúsh.
Wild sheep.	'Urín (ooreen).	'Urin.	Yet, hal.	Rhan.
You, ye.	Tzo (tso).	Má.	Má.	Bisá.
Yes.	Hano (hanun).	Bai.	Díla.	Hasúr.
Yesterday.				
Waist.	Dákhi.	Ashting.	Ashting.	Meh.
Yesterday evening.	Beluko.	Sáti.	Sáti.	Uazen.
Wise.	Akhil chan.	Akhil chan.	Dáná.	Dáná.
Field.	Chaht.	Mal.	Mal.	Chatúr.
Fish.	Chimo.	Chimo.	Chúmo.	Másí.
Wall.	Kút.	Kút.	Kút.	
A pass.	Kún.	Kún.	Kún.	
To return.	Ba, álo.	Dádimi.	Dúdí, a.	Baga, hai

DIALECTS OF WAKHÁN, SHIGNÁN, AND ROSHNÁN.

English.	Wakhán.	Shignán and Roshnán.
1.	Eeu (yú).	Lí, ú.
2.	Bú, í.	Haray.
3.	Trú, i.	Trí.
4.	Tsabúr.	Tsavár.
5.	Paus.	Peeuz.
6.	Shal.	Khír.
7.	'Up (oōp.)	Khiri.
8.	Hath.	Hasht.
9.	Naou.	No, u.
10.	Las.	Lís.
20.	Bist.	Bíst.
100.	Sadd.	Sadd.
1000.	Hazár.	Hazár.
I.	Uez.	Yet.
Thou.	Tu.	'U'z.
He.	You.	Yem.
Here.	Drim.	Yandír.
There.	Dret.	Undír.
Where.	Koomrit.	Kúndir.
Horse.	Yash.	Warch. Vorch (Vorj).
Dog.	Shach.	Kúdh.
River.	Yapakh (Yapak).	Khets.
Mountain.	Koh.	Jír.
Lake.	Chot.	Hauz.
Another.	Dirikh.	Chis.
Bow.	Distee.	Distee.
Arrow.	U'ch (Ooch.)	'U'ch.
Gun.	Miltik.	Miltik.
Sabre.	Khingar.	Cheet.
Rice.	Gring.	Gring.
Fire.	Rikhneek (Rikhník)	Yutz.
Wheat.	Gídím (Gideem.)	Jhindem.
Sun.	Yir.	Aftáb.
Moon.	Jamak.	Mahtáb.
Father.	Tat.	Dád.
Mother.	Nan.	Mád.
Brother.	Varut.	Varád.
Man.	Mardína.	Chorik.
Woman.	Aurat.	Ghín (Ghēēn).
Rock.	Ghá.	Tash.
Plain.	Dasht.	Dasht.
Black.	Shu.	Tír.
White.	Rokh.	Safed.
All.	Kúkt.	Fúk.
Good.	Baf.	Shích.
Bad.	Shak.	Ganda.
Bridle.	Yakhún.	Lagúm (Lajám).
Saddle.	Peru.	Badán.
Hot.	Shúndr.	Garm.
Cold.	Súr.	Ish.
War.	Jang.	Jang.
Near.	Shish.	Sút.
Distant.	Rír.	Rír.

DIALECTS OF WAKHÁN, SHIGNÁN, AND ROSHNÁN (*continued*).

English.	Wakhán.	Shignán and Roshnán.
Hand.	Háth.	Wakht.
Head.	Sar.	Kulah.
Foot.	Pu, et.	Pá.
Eye.	Chashur.	Tsím.
Pass.	Wú, ín.	Kotal.
Voice, sound.	Awágh.	Kiu, kin (Kyu, kin).
To-day.	Wúlk.	Shích.
To-morrow.	Sahár.	Firda.
Difficult.	Mushkil.	Mushkil.
Easy.	Asán.	Asán.
Great.	Lúp.	Kalán.
Small.	Tsiklai.	Zilakík.
Water.	Yapák.	Khetz.
Food.	Khech.	Girdá.
Cloak.	Chikmen.	Gilem.
Earth.	Shet.	Zamín.
Above.	Buland.	Tír.
Below.	Pust.	Píst.
Outside.	Bahar.	Bír.
Inside.	Khún.	Chít.
Sheep.	Kilah.	Gospand.
King.	Meer.	Khá.
True.	Rast.	Rast.
False.	Durogh.	Durogh.
Snow.	Zem.	Barf (Baraf).
To ask.	Púrsam.	Píshtam.
To drink.	Pítam.	Brikhtam.
To give.	Marand.	Múrdak.
To take.	Deshdam.	Zokhtam.
To know.	Uíndam.	Chíktam.
To hear.	Kshenam.	Shinawídam.
To sell.	Púritam.	Farokhtam.
To say.	Kasakhaw.	Gap markui.
To come.	Uezda.	Yet.
To go.	Rech.	Saou (Sao).
To bring.	Núzim.	Sár.
A road.	Varek.	Póu.

ROUTE I.

KASHMIR to GILGIT, by Dras, Skardo and the Indus Valley.

Number of Marches.	Places.	Miles.	REMARKS.
9	Srinagar to Dras	97	Vide Montgomerie's Kashmir route, map.
10	Tashgam ..	14	Road good down left bank of Dras River.
11	Karkitchu ..	14	Two miles below Tashgam, cross by bridge to right bank of river, and recross to village of Karkitchu.
12	Gangany	10	Left bank of Dras River.
13	Olding Shung ..	10½	do. do.
14	Tarkusti	9	Left bank of River Indus.
15	Kartaksho ..	11½	Cross by rope bridge to right bank of Indus.
16	Tolti	13	Recross by rope bridge to left bank.
17	Parkuta	13	On left bank of River Indus.
18	Gol	11	do. do.
19	Skardo	18½	Capital of Baltistan, or Little Tibet.
	Total ..	221½	From Skardo to Gilgit, this road is totally impracticable for animals, and even difficult for men carrying loads.
20	Komára	10½	Cross River Indus by ferry-boat to right bank. At 4½ miles village of Kwardo, then villages of Hassan Shah, and Birgám. Komara, a village containing 140 houses.
21	Tsari	9	To village of Bagardo 3 miles, beyond which, at 6 miles is Tsari; road in one place difficult.
22	Tongus	12	Road for 6 miles good, then very difficult close to the river. In summer this lower road is impracticable, and the route is then over spur of the mountain.
23	Dusoo, or Tormik ..	9	Ascent of ½ mile, then descend to village of Baicha, 5 miles from Tongus; from where, steep ascent of 1½ mile, across spur of hill. Easy descent to village of Dusoo in the Tormik Valley.

KASHMIR to GILGIT—*continued.*

Number of Marches.	Places.	Miles.	REMARKS.
24	Twár, or Rondu ..	12½	Road along mountain side above the Indus, difficult in places. Camp at village of Twár, on the right bank of the Indus, opposite Rondu on left bank. There is a rope-bridge here.
25	Stiriko	6½	Road good. A small village.
26	Stak	13½	For 8 miles road along Indus; then on the ascent up the Stak Valley, to that village, a place of some 80 houses. There is a fort occupied by some troops of the Maharaja of Kashmir. Supplies for the journey on to Gilgit should be carried from here. There is no habitation between Stak and Haramosh.
27	Malapa	10	Road down the Stak Valley for 4 miles, then along right bank of Indus.
28	Chitroon ..	4	Road very difficult. A few huts here.
29	Ubulchu	6	Road good. Camp in ravine, close by the Indus. No wood for fuel close to camp.
30	Shingus	8½	Road very difficult, along precipitous rocks above the Indus.
31	Brundu	9	Steep ascent of 4500 feet to the Shingus Pass, across a spur running down from the Haramosh Peak. The pass is 10,245 feet above the sea. Steep descent of 3 miles to Brundu, on the right bank of Indus, where are some hot springs. It is optional to camp in the ravine near the summit of the pass, and cross the following day.
32	Haramosh ..	8½	Road exceedingly difficult, in many places along precipitous rocks above the Indus. Haramosh is a small village inhabited solely by Brokpas.
33	Shutá	8	Road good. Pass ruined village of Hantsil.
34	Legbut	11	Road along Indus for 7 miles, then up the Gilgit Valley. Camp close by the Gilgit River on left bank.
35	Dainyúr	18½	Road good and level up the left bank of the Gilgit River. Dainyúr is a village situated at the junction of the Hunza-Nagar River.

KASHMIR to GILGIT—*continued.*

Number of Marches.	Places.	Miles.	REMARKS.
36	Gilgit	5	Cross the Gilgit River by rope-bridge. The road continues up the right bank to Gilgit, a place of 200 houses. A large fort, garrisoned by 1500 troops of the Kashmir Maharaja.
	Skardo to Gilgit	161½	
	Kashmir to Gilgit	383	Gilgit is in Lat. 35° 55′ 2″ N, Long. 74° 23′ E., and 5025 feet above the sea.

ROUTE II.

GILGIT to YASSIN.

Route practicable for laden animals throughout.

Number of Marches.	Places.	Miles.	REMARKS.
1	Gilgit to Shurote ..	15½	Road good up the right bank of the Gilgit River, to near the village of Bargo, where cross by rope-bridge to left bank. Horses and laden animals ford the stream. It is not necessary to cross to the left bank, but optional to continue up the left side of the valley to Shurote.
2	Shér Kila ..	7	Pass villages of Skiote and Gulapur, and ford river to Shér Kila on left bank. Shér Kila is an enclosed village and fort, under a petty Raja Esau Bogdúr, nominally subject to the Maharajah of Kashmir. His territory extends as far as Gahkúch, and the whole district is called Ponyál.
3	Gahkúch ..	16½	At 5 miles from Shér Kila Pass the small village of Japook, beyond which, at 4 miles is Singal, an enclosed village on the right bank. A large valley here joins from the southward, up which lies a road leading by the Butar Pass to the country of Dilail. Pass villages of Bubar, Gulmati, and Grunjur to Gahkúch, a large enclosed village. The territory of Raja Esau Bogdúr ends here.

GILGIT to YASSIN—*continued.*

Number of Marches.	Places.	Miles.	REMARKS.
4	Roshan	19½	Road continues up the right bank of the river. At 4 miles above Gahkúch, the junction of the Yassin and Ish Káman Rivers (which form the Gilgit River) is reached. A road conducts up the Valley of the Ish-Káman River, passing Chitor-kun and Ish-Káman, enclosed villages under the Yassin Chief, and crossing the Burogil Pass at its head into the country of Wakhán, in the basin of the Oxus. There is a large lake called "Karambar Sar," at the head of this valley, which has been formed by glaciers falling and blocking up the bed of the stream. The pass is reached in 5 days' journey from Gahkúch. Continue up the westerly valley to Roshan, an enclosed village and fort, under the Yassin Chief. A road conducts from Roshan up a valley to the southward, and crosses a pass at its head to Dilail.
5	Yassin	19½	At 5 miles from Roshan Pass the village of Gupis, beyond which, at 2 miles is the junction of the Yassin and Shevare Valleys. Up the latter a road conducts, *viâ* Peenyul and Shevare, and crossing the Shundur Pass at its head, conducts to Mastuch and Chitrál. Ford both streams, and continue up the left bank of the Yassin River to village of Gindai, near which ford stream, and continue up right bank, past village of Dumyal to Yassin, a large village and strong fort, the residence of Raja Meer Wulli Khán, the ruler of the Yassin territory.
	Gilgit to Yassin Total ..	78	

ROUTE III.

GILGIT to HUNZA.

Number of Marches.	Places.	Miles.	REMARKS.
1	Gilgit to Nomal	14	Cross the Gilgit River by rope-bridge below the fort. Road lies up Hunza Nagar Valley, from opposite village of Dainyúr. Maharaja of Kashmir's territory ends here.

GILGIT to HUNZA—*continued.*

Number of Marches.	Places.	Miles.	REMARKS.
2	Gwetch	6½	A small village.
3	Chult	7	A small enclosed village at the junction of the Chuprote Valley.
4	Boralus	3½	Cross Garmasai river to village of Boralus.
5	Maiyoon	7	Road difficult. Ascent and descent across a spur. The first Hunza fort is at Maiyoon.
6	Hinnee	6	Village (enclosed).
7	Aliabad	9	Ditto. ditto.
8	Ultit, or Hunza	3	Large village and fort, occupied by Ghazan Khan, the Hunza Chief. The Hunza territory contains some 1500 houses, and musters from 1000 to 1200 fighting men. The country is called Kunjoot.
	Total ..	56	Following up the Hunza River, at 1½ mile, is passed the village of Hydrabad, from where, at 18 miles, is the village of Gilmit. At 14 miles above Gilmit is the village of Gujál. From Gujál a road crosses the Shinshál Pass to Shinshál, in the basin of the Yarkand River. A road goes from Shinshál to Yassin, and is followed by the Hunza people.

ROUTE IV.

GILGIT to NAGAR.

Number of Marches.	Places.	Miles.	REMARKS.
1	Gilgit to Jitul	9	At 5 miles from Gilgit cross by rope-bridge to the village of Dainyúr, at junction of Hunza-Nagar River. Continue up left bank of Hunza-Nagar to village of Jitul.
2	Jaglote	6½	A small enclosed village on left bank. Maharaja of Kashmir's territory ends here.

GILGIT to NAGAR—*continued.*

Number of Marches.	Places.	Miles.	REMARKS.
3	Nilt	19	Cross the Shultur Pass over a spur, running down from the lofty Raki Pooshi Peak. Road difficult. The first Nagar fort is at Nilt.
4	Pissun	6½	At 1½ miles pass village of Thol, beyond which, at 2 miles, is enclosed village of Gulmat.
5	Askardo ..	8	At 5 miles pass enclosed village of Fikr. Askardo village and fort.
6	Nagar	5½	At 2 miles, pass enclosed village of Samaiyar. Nagar is a large village and fort, occupied by Jaffir Ali Khán, the Nagar chief. The Nagar territory contains some 3000 houses, and musters about 1500 fighting men.
	Total ..	54½	
			At 28 miles from Nagar, up the valley of that stream, is a village called Hispar, above which cross a pass (road over glacier) into the Basha Valley.

ROUTE V.

GILGIT to DILAIL, by the Choonjur Pass.

Number of Marches.	Places.	Miles.	REMARKS.
1	Gilgit to Jhut (Eng.) ..	13	Pass villages of Napúr and Baseen, close to Gilgit and enter the Kirgah Valley. Huts here.
2	Mazár Mejnoon	13	Road up Kirgah Valley. Mazár Mejnoon, tomb of a Syad. No habitation.
3	Tsakarbos ..	12	Camp at head of Kirgah Valley, near the pass.
4	Kulijoonjee ..	9	At 3 miles cross the Choonjur Pass to Kulijoonjee, in the Kanbari Valley, unfrequented except by herdsmen with sheep and goats. The Kanbari stream rises in the pass, and falls into the Indus at Hoodur (5 miles above Chilás) between Boonji and Chilás.

GILGIT to DILAIL—*continued.*

Number of Marches.	Places.	Miles.	REMARKS.
5	Yahchote	20	At 6 miles cross the Kuli Pass into the Biragah Valley; the stream in which joins the Dilail River. Road down Biragah Valley to Yachote, an enclosed village on left bank. The Kuli Pass is also called Biragah Kún.
6	Samagál	6	Enclosed village. Pass the village of Namakál on right bank.
7	Phoonch	5	Enclosed village on left bank.
8	Gaiyár, or Dilail	11	Large village and fort.
	Total ..	89	The country of Dilail contains about 4000 inhabitants, and musters some 1800 fighting men.

ROUTE VI.

NAGAR to SKARDO, by the Hispar Pass.

Number of Marches.	Places.	Miles.	REMARKS.
1	Nagar to Hoopur	6	Village in the Nagar Valley.
2	Hispar	22	Ditto. ditto.
3	Camp	17	Cross Hispar Pass into Basha Valley. Road along glacier. No habitation.
4	Brok	15	Ditto. ditto.
5	Arundu	13	Village in the Basha Valley.
6	Chitroon, or Ab-i-garm ..	10	Hot springs.
9	Skardo	34	Road down Basha and Shigar Valleys to Skardo.
	Total ..	117	

ROUTE VII.

GILGIT to CHILÁS.

Number of Marches.	Places.	Miles.	REMARKS.
1	Gilgit to Mainoor ..	8	Village in the Gilgit Valley.
2	Chakarkot ..	16½	Cross a low pass into the Sai Valley. Pass villages of Jugote and Shumrote to Chakarkot.
3	Tullichí	18	At 4 miles pass the village of Dumote, and opposite Boonji. Continue down the right bank of the Indus to Tullichí, a small village.
4	Goor	14	A village at junction of the Goor Valley, on right bank of Indus.
5	Dullárn	16	Cross to left bank of Indus by rope-bridge, or cross at Hoodur, 4 miles below, nearly opposite Chilás.
6	Chilás	5	
		77½	

ROUTE VII.—*continued.*

YASSIN to WAKHÁN, by the Darkote Pass.

Number of Marches.	Places.	Miles.	REMARKS.
1	Yassin to Hoondur	11	Pass the villages of Gujalti and Sandi in the Yassin Valley. Road up left side of valley, level and good. At 6 miles from Yassin ford the Tooi River at its junction with the Warchágam (or Yassin River) near the village of Barandos.
2	Darkote	17	At 8 miles pass the village of Dariára, road good. Four miles beyond which is the village of Mushk. Darkote is the last village in the Yassin territory.
3	Darband	7	Encampment.
4	Kirkavish ..	10	Encampment near the Pass.

YASSIN to WAKHAN—*continued.*

Number of Marches.	Places.	Miles.	REMARKS.
5	Burogil ..	15	At 5 miles from Kirkavish cross the Darkote Pass into the basin of the Oxus. Ascent gradual and easy. Pass only closed in winter. Largely used by Badakhshi and Wakhání, petty traders coming to Yassin and Gilgit.
6	Pechoot	11	Encampment in Wakhán territory.
7	Petkaro	10	Ditto. ditto.
8	Sar-i-Sarhadd ..	14	First village in Wakhán territory.
9	Nilt	15	Village in Wakhán.
10	Your	10	Ditto. ditto.
11	Tang	11	Ditto. ditto.
12	Wask	10	Ditto. ditto.
13	Gaskun	10	Ditto. ditto.
14	Zung	11	Ditto. ditto.
15	Panja Kila ..	15	Fort and village. The residence of Meer Futtah Ali Shah, the ruler of Wakhán.
	Total ..	177	From Wakhán, an easy route leads by Kolab, Hissar, and Shahr-i-Salz to Samarcand.

ROUTE VII.—*continued.*

YASSIN to CHITRÁL, by the Shundur Pass.

From information given by Sirdar Bahadur Khán, a brother of Raja Amán-i-Moolk, the Chitrál ruler.

Number of Marches.	Places.	Miles.	REMARKS.
1	Yassin to Khulti	11	Road down Yassin Valley to junction of Warchagam and Ghirza Rivers. Continue up left side of the latter stream to the village of Khulti.
2	Daimul	8	A small village. A road branches from here, which leads up the Baltibur Valley to the country of Tangír, and thence to Dilail.

YASSIN to CHITRAL—*continued.*

Number of Marches.	Places.	Miles.	REMARKS.
3	Peenyul	11	Village under the Yassin Chief.
4	Chashee	10	Ditto. ditto.
5	Shevare	14	At 7 miles pass the village of Barkotee Shevare, a large village under Wuzeer Rakhmat Khán.
6	Laspoor	28	At 5 miles pass the village of Teray beyond which, at 14 miles, cross the Shundur Pass, leading into the head of the Mastuch, or Chitrál Valley.
7	Rahman	17	A Village.
8	Gasht	15	Ditto.
9	Kinootz	8	Ditto.
10	Mastuch	4	Fort and village, the residence of Raja Palawàn Khán.
11	Nisar	16	Village. Road down left bank of the Chitrál River.
12	Tow..	11	Ditto. ditto.
13	Sunoghar ..	10	Ditto. ditto.
14	Miragam ..	4	Ditto. ditto.
15	Awi..	16	Ditto. ditto.
16	Kroigologh ..	17	Ditto. ditto.
17	Buni	11	Ditto. ditto.
18	Jinelikuch ..	12	Ditto. ditto.
19	Charum	11	Ditto. ditto.
20	Reshun	19	Village in the valley of the Chitrál River.
21	Púpish	15	Ditto. ditto.
22	Noghurish ..	7	Ditto. ditto.
23	Maroi	15	At 4 miles pass village of Barenis.
24	Moree	10	Village.
25	Koghuz	11	Ditto.
	Ragh	4	Ditto.

YASSIN to CHITRAL—*continued.*

Number of Marches.	Places.	Miles.	REMARKS.
26	Kari	5	Village.
	Danin	10	Ditto.
	Chusar	4	Ditto.
27	Chitrál	4	Large village and fort, the residence of Raja Amán-i-Moolk, ruler of Chitrál.
	Total ..	326	
			N.B.—The distances are probably over-estimated.

N.B.—There is no town or village called Kashkar (or Cashkar) in the Chitrál Valley. The whole country is called Kashkar. The countries of Yassin, Ponyál, and Mastuch are known as Bud Kashkar (or Upper Kashkar) while Chitrál is known as Kúz (or Lower) Kashkar.

ROUTE VIII.

KASHMIR to GILGIT, by Astor.

Number of Marches.	Places.	Miles.	REMARKS.
1	Kashmir to Bandipoor by boat	35	
2	Tragbul	10	Ascent from village of Kralpoora.
3	Kunzlwan ..	15	Cross Randiangan Pass. Village on left bank of Kishengunga River.
4	Goorais	11½	Road good up right bank of Kishengunga River. Supplies for the journey onward should be taken from Goorais.
5	Kamri	13	Village.
6	Meean Murg ..	12	Huts near Dorikoon Pass.
7	Daskoram ..	29	At 5 miles above Meean Murg, the Skardo road by the Drosai Plains branches to the right. To the summit of the pass is 11 miles from Meean Murg. Road good. Descent gradual to village of Daskoram. The pass is about 13,500 feet above the sea, and is closed in winter.
8	Goodai	14	Village.

KASHMIR to GILGIT—*continued.*

Number of Marches.	Places.	Miles.	REMARKS.
9	Astor	17	Pass village of Naogam and Finnel. Astor is a large place, garrisoned by some 2000 troops of the Maharaja of Kashmir.
10	Dashkin	14½	At 8 miles pass village of Harcho.
11	Dooi	12	Pass village of Mushk half-way. Road along hillside above the Astor River.
12	Boonji	17	Ascend from the village of Dooi to the summit of hill, then steep descent of 7 miles to Ram Ghaut, a bridge across the Astor River. This pass is called the Hatoo Peer. Cross to right bank of river by wooden bridge, and continue up the open valley of the Indus to Boonji on left bank. A fort garrisoned by Kashmir troops is here.
13	Mainoor	23	Cross to right bank of Indus by ferry-boat immediately above Boonji, and continue up Sai Valley past villages of Dumote, Chakarkot, Shumrote, and Jugote. Then ascend spur of hill, and cross into Gilgit Valley to village of Mainoor.
14	Gilgit	8	Vide Route I.
	Total ..	231	

N.B.—The road throughout is practicable for laden animals. The Dorikoon Pass is a very easy one. The Hatoo Pass between Astor and Boonji very difficult for laden animals.

INSTRUMENTAL OBSERVATIONS IN THE GILGIT AND YASSIN VALLEYS, &c.

24th January, 1870.—At the village of *Haramosh*, near the great bend of the River Indus, observed for latitude:—

Sun's meridian altitude	34°	57′	0″
Refraction	0	1	7
	34°	55′	53″
Zenith distance	55	4	7
Sun's declination, for longitude, 74° 45′ E...	19	13	45
Latitude of Haramosh	35°	50′	22″ N.

25th January, 1870.—At the great bend of the Indus, one mile below the village of Haramosh, observed the boiling-point of water to be 204° 4′; temperature of air, 45° Fahr.; level of river, 4535 feet above sea-level.

26th January, 1870.—At the junction of the Gilgit River with the Indus, observed the boiling-point of water to be 204° 9′; temperature of air, 51½° Fahr.; height of Indus at junction of Gilgit River, 4260 feet.

At the village of *Boonji*, five miles South of the junction, observed the boiling-point of water to be 203° 6′; air, 57° Fahr.; height, 4885 feet; level of the Indus at the ferry below Boonji, 4205 feet.

At Camp Legbut, on the left bank of the Gilgit River, 1½ mile North of its junction with the Indus, made the following observations for latitude:—

26th January, 1870.—Meridian altitude of Star.

B Orionis (Rigel)	45°	53′	15″
Refraction	0	0	56
	45°	52′	19″
Zenith distance	44	7	41
Star's declination, South	8	21	15
Latitude	35°	46′	26″ N.
Meridian altitude of Star Canis Majoris (Sirius)	37°	42′	30″
Refraction, &c.	0	1	3
	37	41	27
Declination of Sirius, South	16	32	25
Latitude	35°	46′	8″ N.

By altitude of the Pole Star.

	h.	*m.*	*s.*
In longitude 74° 40′ East; and at	10	33	15 Mean-time.
The observed altitude of the Pole Star was	35°	51′	30″

Formula.

	h.	*m.*	*s.*
Mean-time	10	33	15
Difference, long. (74° 40′) in time	4	58	40
Greenwich mean-time	5	34	35
Sidereal time at Greenwich, mean	20	22	18·35
Mean-time at Lagbut	10	33	15
Acceleration for $5^{h.}\ 34^{m.}\ 35^{s.}$	0	0	54·95
Sidereal time of observation	6	56	28·3
Altitude of Pole Star	35°	51′	30″
Deduct for refraction, &c.	0	1	5
	35	50	25
Subtract	0	1	0
Reduced altitude	35	49	25
With argument $6^{h.}\ 56^{m.}\ 28^{s.}$ first correction	0	5	15
Approximate latitude	35°	44′	10″
Arguments, 35° 50′, $6^{h.}$ $56^{m.}$ } 2nd correction ..	+	0	42
Arguments, Jany. 26th, $6^{h.}$ $56^{m.}$ } 3rd correction ..	+	0	58
Latitude	35°	45′	50″ N.
Adopt for latitude of Camp Legbut	35°	46′	8″ N.

27*th January*, 1870.—At *Chamogar*, Gilgit Valley, observed for latitude:—

Meridian altitude of Star B Orionis (Rigel)	45°	50′	0″
Refraction	0	0	55
Zenith distance	45	49	5
	44	10	55
Star's declination, South	8	21	27
Latitude of Chamogar	35°	49′	28″ N.

28*th January*, 1870.—At the village of *Dainyúr*, at the junction of the Hunza-Nagar River with the Gilgit River, observed for latitude:—

Meridian altitude of Star B Orionis (Rigel)	45°	45′	15″
Refraction	0	0	55
	45°	44′	20″
Zenith distance	44	15	40
Star's declination, South	8	21	27
Latitude	35°	54′	13″ N.

7*th February*, 1870.—At *Gilgit*, observed for latitude:—

Meridian altitude of Star A Canis Majoris (Sirius)	37°	33′	30″
Refraction	0	1	4
	37°	32′	26″
Zenith distance	52	27	34
Star's declination, South	16	32	37
Latitude	35°	54′	57″ N.

9*th February*, 1870.—Observed for latitude at *Gilgit*:—

Sun's meridian altitude	39°	24′	0″
Refraction	0	1	0
	39°	23′	0″
Zenith distance	50	37	0
Sun's declination for longitude 74° 23′ E. ..	14	41	58
Latitude	35°	55′	2″ N.

Boiling-point of water (mean of several observations), 203° 5′; temperature of air, 49° 8′; height, 5025 feet above the sea. Adopt for latitude of the Fort of Gilgit, 35° 55′ 2″ N.

21*st February*, 1870.—At the village of *Bargo*, 13¼ miles from Gilgit towards Yassin, observed for latitude:—

Altitude of Star A Canis Majoris (Sirius)	37°	25′	30″
Refraction	0	1	4
	37°	24′	26″
Star's declination, South	16	32	40
Latitude	36°	2′	54″ N.

23*rd February*, 1870.—Boiling-point of water at *Shér Kila*, 202° 3′; air, 55° Fahr.; height, 5670 feet above sea-level.

24*th February*, 1870.—At *Gahkúch*, observed for latitude :—

Altitude of Star A Canis Majoris	37°	19′	5″
Refraction	0	1	4
	37°	18′	1″
Zenith distance	52	41	59
Star's declination, South	16	32	40
Latitude	36°	9′	19″ N.

25*th February*, 1870.—At *Gahkúch*, observed for latitude :—

Sun's meridian altitude	44°	43′	0″
Refraction	0	0	57
	44°	42′	3″
Zenith distance	45	17	57
Sun's declination for long. 73° 57′ E. ..	9	8	25
Latitude	36°	9′	32″ N.

At Hoopur encampment, above the junction of the Yassin and Ish Káman rivers, observed boiling-point of water, 200° 5′; air, 52° Fahr.; height, 6448 feet.

At the village of *Gupis*, 1½ mile below the junction of the Warchágham (Yassin) and Ghirza (Shevare) rivers, observed for latitude :—

15*th March*.—Altitude of Star A Canis Majoris (Sirius)	37°	14′	30″
Refraction	0	1	4
	37°	13′	26″
Zenith distance	52	46	34
Star's declination, South	16	32	40
Latitude of Gupis	36°	13′	54″ N.

Boiling-point of water at Gupis, 199° 4′; air, 48° Fahr.; height, 7278 feet.

28*th February*, 1870.—At *Yassin*, observed boiling-point of water, 198° 6′; air, 559° Fahr.; height, 7765 feet.

2*nd March*.—Observed for latitude of Yassin :—

Sun's meridian altitude	46°	24′	0″
Refraction	0	0	55
	46°	23′	5″
Zenith distance	43	36	55
Sun's declination for long. 73° 34′ E. ..	7	14	22
Latitude	36°	22′	33″ N.

3*rd March*, 1870.—Observed for latitude :—

Sun's meridian altitude	46°	46′	45″
Refraction	0	0	55
	46°	45′	50″
Zenith distance	43	14	10
Sun's declination for long. 73° 34′ E. ..	6	51	26
Latitude	36°	22′	44″ N.

Adopt for *Yassin*, Lat. 36° 22′ 38″ N.; long. 73° 34′ 15″ E.; elevation, 7765 feet.

N.B.—The heights above sea-level are referable to the station of the Great Trigonometrical Survey of India on the rock above *Skardo*, at an elevation of 8867 feet above the sea. The country in the basin of the Gilgit and Yassin rivers, &c., has been filled in from triangulation, and bearings to the following peaks:—

Nanga Parbat or Dayamar Peak, in Lat. 35° 14′ 21″ 5 N.; Long., 74° 37′ 52″ 5 E.; elevation 26,629 feet.

Haramosh Peak, in Lat. 35° 51′ N.; Long., 74° 57′ E.; height, 24,285 feet.

Manokar or Raki Pooshi Peak, in Lat. 36° 10′ N.; Long., 74° 32′ 30″ E.; height, 25,561 feet.

II.—*The Geography of the Bed of the Atlantic and Indian Oceans and Mediterranean Sea.* By Captain SHERARD OSBORN, R.N., F.R.S., &c.

Read, November 29, 1870.

GEOGRAPHY, or, in other terms, a description of the planet on which we live, must necessarily be very imperfect, unless the waters which cover three-fourths of its area,* and represent one-fifth of its entire weight or volume, be included in such an analysis. Yet a description of the ocean to-day falls far short of what geographical research enables us to do with reference to the terrestrial portion of our globe. Indeed, it is only very recently that geographers were in a position to tell us anything reliable of an element which plays so important a part in supporting human life, and ministering to human happiness and progress. When Humboldt penned his 'Cosmos,' he acknowledged the deep interest which the hidden mysteries of the ocean awakened in his breast; how much they deserved to be studied; and, whilst acknowledging the then valuable discoveries of Mr. Darwin, he pointed out the direction in which the quest should be *pursued* by all true lovers of geography.

Had Alexander von Humboldt lived to our times, how he would have rejoiced at the progress we have made, and of the still greater promise which lies before the geographer and naturalist, of a few more years adding vastly to our knowledge of the hidden things of the great ocean! It is not many years since my worthy friend Captain Maury, of the United States Navy, published his deeply interesting work on the Physical Geography of the Sea,—a work which has done more than any book ever before published, to attract the attention of all men

* Area of globe 197 millions English square miles: 51½ millions land; 145½ millions water.

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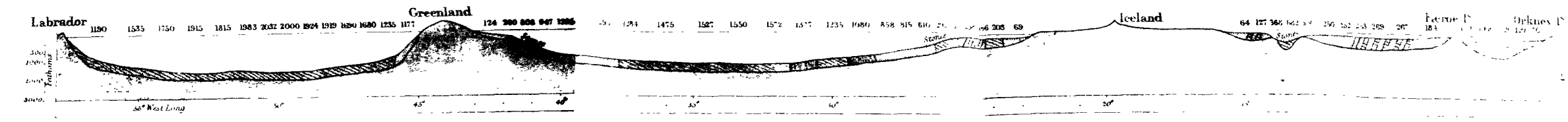
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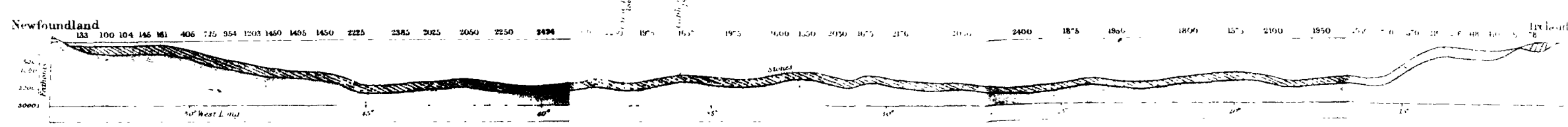
DEEP SEA SECTIONS.

TO ILLUSTRATE THE PAPER BY CAPTN SHERARD OSBORN, R.N.



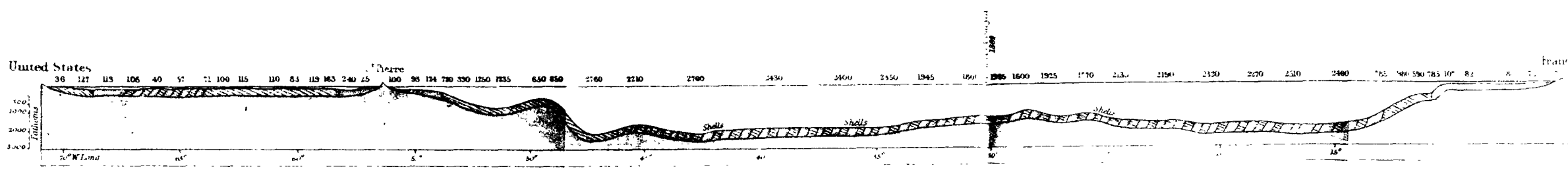
SECTION OF THE BED OF THE ATLANTIC OCEAN BETWEEN THE ORKNEY Is AND LABRADOR

Horizontal Scale
50 100 200 Miles



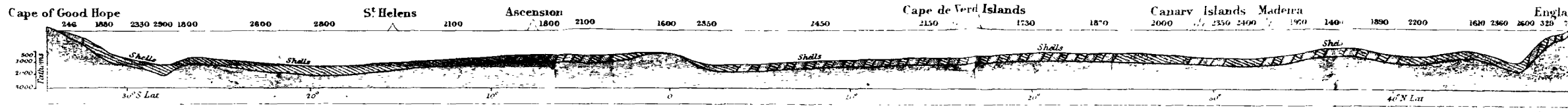
SECTION OF THE BED OF THE ATLANTIC OCEAN BETWEEN IRELAND AND NEWFOUNDLAND

Horizontal Scale
50 100 200 Miles



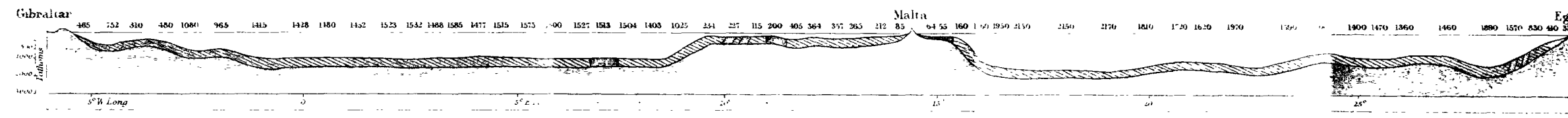
SECTION OF THE BED OF THE ATLANTIC OCEAN BETWEEN FRANCE AND THE UNITED STATES

Horizontal Scale
50 100 200 Miles



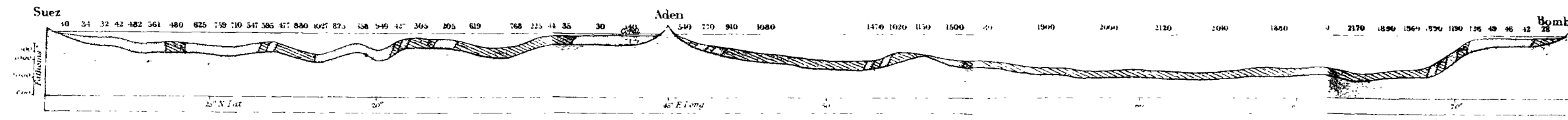
SECTION OF THE BED OF THE ATLANTIC OCEAN BETWEEN ENGLAND AND THE CAPE OF GOOD HOPE

Horizontal Scale
50 100 200 Miles



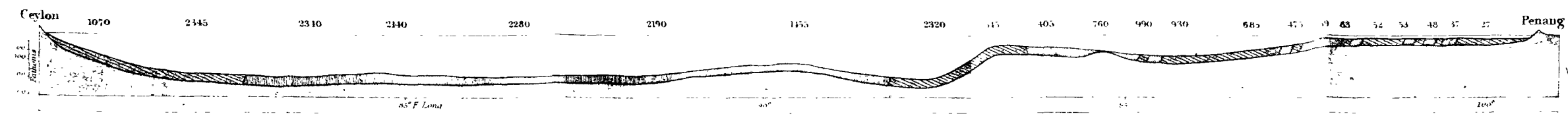
SECTION OF THE BED OF THE MEDITERRANEAN SEA BETWEEN GIBRALTAR AND EGYPT

Horizontal Scale
50 100 200 Miles



SECTION OF THE BEDS OF THE RED SEA AND INDIAN OCEAN BETWEEN SUEZ AND BOMBAY

Horizontal Scale
50 100 200 Miles



SECTION OF THE BED OF THE BAY OF BENGAL

Horizontal Scale
50 100 200 Miles

ROCK SAND CLAY MUD OR OOZE

Published for the Journal of the Royal Geographical Society by J Murray Albemarle Street

of observation whose business lies on the deep waters, to the wondrous phenomena every day offered to their view, and the necessity, in the cause of science, of not being merely satisfied with what is passing on its surface, but to endeavour to probe its mysteries down to the solid crust on which the ocean resteth. And, perhaps, the best compliment which can be paid to Maury is the fact, that the spirit of research he awakened, has produced results which subvert many of the theories and facts he enunciated, based on the imperfect information he then possessed. Science, it is true, can have no stand-point of finality, as long as human knowledge is, as we must believe, progressive; but assuredly there is no branch of human knowledge that has recently made more rapid advance than that of the Physical Geography of the Sea; and every day goes to prove the truth of Darwin's opinion, endorsed by Humboldt, that when its depths should be searched, no portion of our planet would present such fulness of organic life; that, rich as our lands and forests may be in varied forms of animal life, they would fall far short of the ocean in numbers and variety, even in depths as great as our loftiest mountain ranges. And the truism of the great German philosopher deserves repetition, that it was the contact of man with the ocean, dating from the time when Columbus first unbarred its gates, which unquestionably exercised a beneficial influence on the cultivation of the intellect and formation of the character of many nations, told us of the true form of our earth, turned men's thoughts to the pursuit of astronomy and all the mathematical and physical sciences, and last, but not least, created a multiplication of those bonds which will eventually unite the whole human race.

I do not propose, nor am I competent, even were I disposed to attempt it, to lay before the Royal Geographical Society the manifold discoveries science has recently brought to light, of the mysteries of the liquid element which rolls around our planet. Indeed, I believe it would be premature for anyone to make the attempt, until the researches in the form of the scientific exploration of the deep sea, under the auspices of our Royal Society, are completed; and in proof of this opinion I would merely point to the last number of the Proceedings of that learned Society, vol. xviii., no. 121, containing the Reports of Dr. Carpenter, Professor Wyville Thomson, and Mr. J. Gwyn Jeffreys, during their researches of 1869, narrating discoveries as startling as they are precious, and likely to be still further increased by the results of the Royal Society's operations during the current year.

I propose to confine myself in this paper, to placing on record one section of the harvest of knowledge regarding the sea-bed

which we are now garnering, viz.: That which tells of the depth of the ocean, and the character and form of the earth's crust on which it rests: a knowledge still far from perfect, but which has made such important progress, that within the last few years we have been enabled to lay nearly 17,000 miles of submarine telegraph cable (worth more than six millions sterling) across those silent depths with perfect safety; and aided by electricity, are bringing the uttermost parts of the earth into momentary communication with each other.

The diagrams annexed represent our knowledge of the form of the ocean-bed throughout the following seas:—

Three sections of the North Atlantic.

A. That between the Orkney Islands and Labrador, through a great curve, *viâ* the Faröe Islands, Iceland, and Greenland.

No. 1. That between Ireland and Newfoundland.

No. 2. Between France and the United States.

No. 3 shows a section of the two Atlantic Oceans in a longitudinal direction, from the parallel of England to that of the Cape of Good Hope.

No. 4 is a section of the Mediterranean Sea, from the meridian of Gibraltar to that of Alexandria.

Nos. 5 and 6 are sections of the bed of the Indian Ocean, from Penang to Ceylon, and from Bombay to Aden, and up the Red Sea to Suez.

In order to make the diagrams sufficiently clear to show the variations in depth and the nature of the bottom, I found it necessary to give the depth of the water on a much larger scale than the scale of distance.

Thus, in the accompanying sections, the scale for the distance will be found indicated at the foot of each diagram, but the depth is exaggerated roughly to about twenty times the scale of the length or distance from England or France to America.

In the diagram I have endeavoured to delineate the different character of the bottom of the ocean by various shades, the key to which is annexed. Nothing, so far as the descriptions of bottom is concerned, is left to supposition, the diagrams being based on assured soundings; and wherever sand, shell, coral, ooze, &c., are drawn, the fact has been verified by the bottom having been drawn to the surface in the sounding-tube, in quantities varying from a quillful to that of a small coffee-cupful.

If at any time hereafter additional soundings should be procured, or specimens of the bottom obtained at variance with the data upon which these diagrams are founded, it will be easy for me to insert the necessary corrections.

Section A is delineated upon the soundings obtained by

Captain Sir Leopold M'Clintock during his hydrographic survey for a north-about cable route in 1860.

Section 1 is almost entirely the result of the soundings obtained by Captain Dayman of our Royal Navy, and some of those by Lieutenant Lee of the United States Navy.

Section 2 shows the results of a portion of some of Captain Dayman's soundings, considerably added thereto by Navigating Lieutenant O. F. Johnson, R.N., in 1869, when we had to complete that section to enable the Telegraph Construction Company to submerge a cable from Brest to New York *viâ* the Island of St. Pierre.

No. 3, the longitudinal section of the Atlantic Ocean, is entirely based on the admirable series of soundings obtained by Captain Shortland, of H.M.S. *Hydra*, when on her voyage home from the Cape of Good Hope in 1868.

The line upon which that section is made will be best understood by referring to the Admiralty chart, on which the track of the *Hydra* is delineated. Thanks to the valuable deep-sea soundings, and the specimens of the bottom, which were nearly in all cases obtained by Captain Shortland, we have before us a fair representation of the form of the bed of the Atlantic Ocean in a north and south direction.

The three cross sections between Europe and America show that the maximum depth in no case amounts to 3000 fathoms, or 18,000 feet, and the greatest depth is in about the 42° w. long., where 2760 fathoms were obtained by Lieutenant Johnson; and about 300 miles north of that locality it was still 2400 fathoms deep. Sir Leopold M'Clintock, too, 450 miles further north, and a little to the westward, also found a depth of 2000 fathoms in the valley of Davis Straits and Baffin's Bay.

This may be called the western valley of the Atlantic. It is possible that a little further south than these cross sections, and in the direction of the Gulf Stream, deeper water may yet be found between the Bermudas and the American shore; but as in the whole range of soundings obtained by Captain Shortland throughout the Atlantic between 50° N. lat. and 35° s. lat., the maximum depth was only 2900 fathoms, I see no reason for supposing that even in that western valley of the Atlantic, depths exceeding 3000 fathoms, or 18,000 feet, are likely to exist.

The theory of the force and volume of the Gulf Stream, which Maury ingeniously enunciated as likely to gouge out of the earth's crust some deep trough, has not been verified round the edge of the Newfoundland Bank, shown in Section 2; and

had the Gulf Stream the force which he and others supposed, down to any great depth, we should not have succeeded, as we did in 1869, in laying a cable across it without a great loss of slack cable by the current acting upon it. It is worthy of remark, that the verification of the form of the bottom, and the depths obtained by hydrographers, is mainly due to submarine telegraphy; for the cable, as it is submerged, runs over a dynamometer calculated to indicate the strain of the cable running out at a certain speed at the depths shown in the chart.

If, therefore, the cable-laying ship on the surface of the sea were to traverse some extraordinary depth which the lead had missed, or the cable be subjected to some unknown force occasioned by a rapid current, the dynamometer would immediately indicate it; but in the three cables which we have successfully submerged across the Atlantic, the strain on the dynamometer has in all cases agreed admirably with that due to the depth shown on the accompanying diagrams.

The contour, therefore, of the North Atlantic basin may, I think, be safely considered as accurately delineated by these sections, and represents two great valleys, separated by an intervening range, which we can trace from latitude 40° N. as far as Iceland in 64° N., or for a distance of about 1400 miles.

The eastern valley extends from 10° to 30° W. longitude, and the western valley from 30° to about 50° W. longitude.

Each of these valleys, therefore, is about 20°, or 800 miles* in width. The depth of the eastern valley has a mean of about 12,000 to 13,000 feet below the level of the sea, or rather less in depth than Monte Rosa† in Switzerland—the highest point in Europe—is in height above it; and as we are able by consulting the four diagrams before us to trace this valley from about the latitude of the Faröes, where it narrows very much, and terminates down as far as the equator, this vast submarine plain may be said to be nearly 62 degrees, or 3700 miles in length. It may at first appear that a valley or plain of such vast extent is unlike anything we know of in the world above the waters, but I would remind geographers that the great plains of North America extend from Texas east of the Rocky Mountains down to the shores of the Arctic Circle, and that the aggregate lengths of the Pampas and Llanos of South America in no way fall short in extent of this submarine Atlantic valley.

The western valley has a maximum depth of 16,800 feet, or

* The degrees of longitude are about 40 miles each.
† Monte Rosa 15,174 feet.

four times more below the level of the sea, than the highest point of the Appalachian or Atlantic mountain system in America rises above it. This valley we are able, thanks to the hydrographic soundings, to trace from the latitude of the Azores as far as Greenland, where it bifurcates, the deeper portion of it pointing still northward up Baffin's Bay; and down its double valley pours that Arctic current, laden with ice-field and iceberg, which plays so important a part in the circulation of the waters of the Atlantic.

The submarine ridge which divides these two valleys in about 30° w. longitude, appears to be of singular uniformity of height, or rather of depth, from the surface; having only 1600 fathoms, or 9600 feet of water on its crest between the Azores and the latitude of the Hebrides, where it rises gradually, and culminates above water in Iceland with the volcano of Mount Hecla and its geysers. How far south of the Azores this ridge extends it is impossible yet to say; but, looking to its undoubted volcanic character in Iceland and Azores, it seems to me probable that we shall eventually trace its connection in a south-west direction towards that vast volcanic area embraced by the dormant and active volcanos of the West Indies, the Caraccas, and Guatemala, and of which the Caribbean Sea seems to be the crater.

The eastern Atlantic valley, if we look at Section 3, which represents it longitudinally, extends as far south as the equator, having upon its western side the Azores ridge before referred to, and on its eastern side the gradual slope upwards of the foundations of the European and African continents, with the lofty peak of Madeira, Teneriffe, and the Cape de Verds projected from it.

At the equator a rocky ridge occurs, probably of volcanic character, on which rest the solitary peaks of St. Paul's Rock, Fernanda de Noronha, and Ascension; and this ridge seems, as it were, to mark the separation of the North Atlantic basin from that of the south. Its width may be roughly estimated at about 480 miles in a north and south direction, with a mean depth of water upon it of 1800 fathoms: and Captain Shortland's soundings prove that the bottom of the South Atlantic deepens gradually until, in about 20° s. latitude, its depth is again 2800 fathoms, or exactly the same as the maximum oceanic depth yet obtained in the western valley of the North Atlantic.

Whether this remarkable coincidence points to the fact that the oceanic depths in the southern hemisphere will be found not to exceed those of the north, it would be premature yet to

say; but I trust the day is not far distant when a line of soundings will be obtained, from the American continent across the South Atlantic and Indian Oceans to Australia, placing that question beyond all doubt.

The section of the bed of the Mediterranean between Gibraltar and Alexandria is based on soundings obtained by Captain Spratt, R.N., Captain Nares, R.N., and a few furnished by the French hydrographic department.

It will be seen that this sea is divided into two basins or valleys by a lofty block of land, probably of volcanic origin, lying between 10° and 15° E. longitude, having only a maximum depth of from 200 to 300 fathoms of water on the top of it; and out of its crest projects Sicily, with the active volcano Mount Etna, and numerous islands and shoals, such as Malta, Pantellaria, Skerki Rocks, &c.

The western basin from this central submarine range, until the Straits of Gibraltar are approached, is singularly level, averaging from 1400 to 1500 fathoms, or 8700 feet below the level of the sea, and covered with soft mud or ooze.

The eastern basin, between Malta and Alexandria, is left uniform, the bottom being more undulating, and ranging from 2150 fathoms to as little as 1100 fathoms; but the bottom throughout the deep part of this valley consists of mud similar to that found in the western valley.

These two Mediterranean basins are, as the geographer must be aware, of very irregular shape: the maximum length of the eastern one extending from Malta to the shores of Syria, south of Crete and Cyprus; and the western basin having a long, deep-water valley extending north and south from Algiers to Toulon. In the western basin a scientific expedition has been at work in H.M.S. *Porcupine* during the summer of 1870; and there is reason to hope that the results will be as valuable to all interested in the progress of the physical geography of the sea, as the previous explorations in the Atlantic seem likely to be.

It is worthy of remark, that in both these basins the shores are for the most part rocky or coral when within a depth of 200 or 300 fathoms, but that, despite of the near proximity of volcanos like Etna, Stromboli, and Vesuvius, no volcanic disturbance has taken place in either of these valleys, over a period of ten years, sufficient to disturb so sensitive a test as a submarine cable.

It will be observed in these delineations of the bottom of the Atlantic Ocean and Mediterranean Sea, that there is a great absence of anything like abrupt depths or sharp outlines, that

the contour is soft and rounded, and that there is a remarkable absence, for so vast an area, of bare rock.

This remark will be found to be applicable to all the sections of the deep sea, and I own that I was not prepared for it, and that it has only been after the experience of ten years that I am prepared to accept it. My first idea of the bottom of the sea was perhaps the same as that of a great many other geographers, viz., that we should find the crust of the earth underneath the element called water, very much what we knew it to be under the element called atmosphere.

On a superficial view of the subject it was natural to suppose that if the earth above water was marked by abrupt mountain ranges, steep table-lands, with deep valleys, clefts, cataracts, *cañons* and *quebradas*, the crust of the earth, even under the ocean, would resemble it; but this I feel almost convinced is an erroneous theory, and that the bed of the ocean is not subjected to the wearing forces which occasion all these phenomena on earth proper.

I doubt much whether the currents of the ocean extend to any very great depth. Indeed, the experience of all our cable-laying expeditions, which are now pretty numerous, goes to prove that though there may be, and no doubt is, a healthy circulation going on in all depths, even the most profound, yet there is an absence of those mighty streams which, did they exist, would score up and constantly change the form of the bottom of the sea, in the same way that water and atmosphere combined act upon that portion of the crust of the earth which is above the great waters.

In fact, if I may be permitted to theorize, I fancy the bed of the Atlantic, if the waters were removed to-morrow, would resemble much those comparatively level regions known to us, such as the Desert of Sahara, the prairies of North America, or the Pampas of the South, and that they likewise were once in all probability the bottoms of ancient oceans.

It is worthy of remark that in the oceans and seas of the western hemisphere, there is little variety in the nature of the bottom where the depth ranges from 6000 to 18,000 feet, and how rarely (so far as hydrographic surveys have gone) the rock crops through the submarine surface.

When the first line of soundings were obtained between Newfoundland and Ireland, and stony bottom was recorded in only one spot, 33° W., hydrographers and engineers were so struck with the fact, and of the extraordinary advantages it offered as a soft bed on which to lay submarine cables, that it was christened "the Telegraphic Plateau;" but subsequent explora-

tions prove this characteristic to be by no means confined to one place, but to be general throughout the whole area of the deep ocean.

In fact, we have before us, on this record, another proof of the sound geological deduction that, there is a constant accumulation on the deep-sea bottom of the *débris* of successive generations of organic life, which pervades all its depths, and all its varied climates, represented by the almost tropical warmth of its upper strata and the frigid temperature of the waters at its bottom.

Where on these sections the hydrographer marks ooze, soft mud, and fine shells, the geologist and naturalist recognize the great processes of nature, where successive generations of organic life are forming strata of limestone and chalk; the basis which, acted upon by heat and pressure from volcanic causes, form the marble and calcareous rocks of the earth above water.

Before passing to the consideration of the waters in the eastern hemisphere, I may point to two spots on the ocean-bed of the Atlantic which are already invested with historical interest. That which I have marked in Section 1 is the place where, from a depth of 1657 fathoms of water, the telegraph cable, which was lost in 1865, was recovered on the 2nd September, 1866, spliced, and eventually connected with Newfoundland; and in Section 2, in 30° long. and 2000 fathoms of water, the French cable had suddenly to be cut and allowed to descend to the bottom, and yet was recovered within forty-eight hours,—two feats of which British sailors and engineers may justly be proud, and our telegraph-cable manufacturers claim as unparalleled achievements.

We will now pass to a consideration of the sections of the Indian Ocean north of the equator. Thanks to the admirable surveys of Captain Bullock in H. M. S. *Serpent*, Captain Shortland in H. M. S. *Hydra*, Captain Pullen in H. M. S. *Cyclops*, and the verification of the two last by Captain Halpin of the mercantile marine, whilst employed by the Telegraph Construction Company in laying a cable 3600 miles long, from Bombay to Aden and Suez, and another from Penang to Madras, we have before us very accurate sections of the ocean from the Malay Peninsula to Hindostan, from Hindostan to the entrance of the Red Sea, and thence to Suez.

Section 5 carries us from Bombay down a gentle slope of about 240 miles in length, with a depth increasing from 28 to 1900 fathoms water, where the extreme level of the bottom of that ocean is reached; and it then extends with singular

uniformity and a soft muddy bottom, never exceeding 2200 fathoms in depth for 14° of longitude, or 840 miles, until we approach what may be considered as the upward slopes of the African continent, forming a basin singularly resembling the great valleys of the Atlantic bed in both contour and extent.

The section of the Red Sea between Aden and Suez is very different in character. It represents a series of submarine hills of rounded outline, but it will be observed that that outline (which of course is the centre of the sea) is everywhere covered with silt, mud and sand,—the latter characteristic naturally arising from the vast quantity of sand thrown into the Red Sea by the winds blowing over the deserts of Africa and Arabia, which eventually settle to the bottom; and Professor Huxley tells me that, in examining with the microscope the fine mud which Captain Shortland's soundings brought up over the area between Africa and India, this fine sand, in smaller or greater quantities, was the only distinctive feature between the ooze of the bottom of the Indian Ocean and that of the Atlantic. Apart from the depth of water, contour of the ocean-bed, and nature of the bottom, Captain Shortland has furnished us with a beautiful series of the temperatures of the sea at various depths between Bombay and Aden, showing that on the Bombay Bank the surface water ranged from 72° to 78° Fahr., whilst the bottom water was from 73° to 77°. Coming off this bank we find the surface water 75°, gradually diminishing to 50° at 500 fathoms, 42° at 1000 fathoms, and then rapidly descending, until, after reaching a depth of 1700 fathoms, the temperature, he tells us, was nearly constant at 33½ Fahr. This is a most interesting fact, because the Mozambique Gulf stream which that officer sounded across, carries with it a volume of warm water equal in temperature to that of the Atlantic Gulf stream, and as the warm water of the Mozambique stream did not appear to extend downwards below 100 fathoms, I think we may safely infer that when the Atlantic Gulf stream is similarly sounded and tested, we shall not find its depth or volume vertically so great as has sometimes been suggested. I annex Captain Shortland's data.

So level was the bottom of the Indian Ocean, and so accurate were the depths on our charts, that Captain Halpin assured me that, when he was laying the Indian cable, he could, had I not stringently forbidden him to go faster than five knots an hour, have safely laid it, running the *Great Eastern* at a much greater speed.

Turning from this portion of the Indian Ocean to that on the

Eastern side of the Indian peninsula, Section 6, we remark another basin or submarine valley, closely resembling the one above alluded to, for 11 degrees, or 660 miles of longitude; the depths again range from 1000 fathoms at the sides to 2200 fathoms in the centre, with a similar bottom of clay and ooze, and a gradual ascent on the east to the shoulder of a ridge, which no doubt extends north and south in the Bay of Bengal, and from its crests project upwards the Andaman and Nicobar Isles.

There is then a slight fall until the entrance of the Straits of Malacca is approached, when we come on a plateau with only 30 or 40 fathoms of water, which extends eastwards through the Straits of Malacca as far as Borneo upon one side and Cochin China upon the other. To this eastern Indian valley the same remarks are applicable as I have made on the western Indian one, and indeed to the general features of the Atlantic bed; and across it a submarine cable has been laid, which will bring China, the Eastern Archipelago and Dutch possessions into as rapid and certain communication with us, as we have to-day with Egypt, India and the United States.

I do not propose in this paper to dwell on other interesting physical facts revealed by the labours of the gallant officers and men of science who worked out these important surveys, beyond stating that, in profound depths of the Atlantic, Mediterranean and Indian Ocean, we everywhere find a temperature ranging from 33° to 35° Fahr., showing that at the bottom of the ocean a uniform climate exists; and there is little doubt that, throughout all that sub-oceanic region, organic life in some degree is to be found; and I who have seen all forms of animal life abundant, and living in the dark and rigorous climate of our northern pole, cannot but cordially agree with the opinion of Messrs. Carpenter, Jeffreys and Thomson, in their treatise on 'Scientific Exploration of the Deep Sea,'* before referred to, that there is light as well as life in the most profound abyss, and that possibly the phosphorescence which the sailor and the naturalist have everywhere remarked in connection with the inhabitants of the ocean, serves in regard to their obtaining a supply of food, the great object of animal life, to perform the function at the bottom of the sea which light renders us on the earth above the water.

Taking a general view of the accompanying diagrams, I have endeavoured, aided by my friend Mr. Bedwell, R.N., to submit to this Society accurate sections of those portions of the oceans

* See page 431.

in the eastern and western hemispheres which have been sounded; and I think that we may safely infer that the general features of the rest of the Indian and Atlantic Oceans will be found, when explored, not to be very dissimilar. The Pacific Ocean, I am assured, will before long be sounded across from California to Japan, and from the Sandwich Isles to Australia. A few soundings have already been obtained in the North Pacific, and that great ocean is nowhere found to be 3000 fathoms in depth,—showing, as I have before said, that we may now feel pretty sure of having the maximum depth of all deep oceans. Whether the polar areas will ever be sounded or surveyed in our time is a question; but, seeing how steadily and constantly our knowledge of the physical geography of the sea is progressing, I should be wrong indeed not to believe that, before many years the icy barriers of the arctic zone will have to yield up their mysteries to the enterprise and energy of our seamen and men of science.

I cannot conclude this paper without bearing my humble testimony to the valuable services rendered by the hydrographic department of the British Admiralty to the progress we have made within the last few years in deep-sea soundings.

There is no doubt that the surveyors of the United States Navy took the lead, under the inspiration of Captain Maury, in this research; and to Lieutenant Brooke's ingenious invention, whereby the weight could be detached after the line struck the bottom in great depths, is mainly due the success with which that branch of hydrography has been recently pursued; for it was not until the surveyor could recover all the line paid out, and bring to the surface a specimen of the bottom, that deep-sea soundings could be considered reliable, and all previous attempts were simply tentative.

The data upon which the diagrams have been prepared are to be found on the respective sheets of the Admiralty charts, and it is only just to my distinguished friend Admiral George H. Richards, the hydrographer of the Admiralty, to point out how deeply indebted men of science, sailors and the public generally, are to him for the marked progress made since he has held that office, in the extension of deep-sea soundings, and the collection of other valuable data, without which it would be impossible to place these charts of the bottom of the ocean before the Royal Geographical Society, or for submarine telegraphy to have succeeded in bringing the uttermost parts of the earth together, as it has done, in our time.

TEMPERATURE OF THE SEA AT VARIOUS DEPTHS BETWEEN BOMBAY AND ADEN. BY CAPTAIN P. F. SHORTLAND, H.M.S. *Hydra*.

ON BOMBAY BANK, 28TH JANUARY, 1868.

Temperature of Air.	Water.		
	Depth.	Temperature of Surface Water.	Temperature of Bottom Water.
Deg. Fahr.	Fathoms.	Deg. Fahr.	Deg. Fahr.
72¾	11	72½	73¾
76½	36	78½	78
75½	40	78½	76
74½	45	79	78½
73	47	78	77
72½	51	78¾	77

BETWEEN BOMBAY AND KOORIA MOORIA.

Mean of Observations between 28th January and 12th February, 1868.

Mean Temperature of the Air 74½° *Fahrenheit; Greatest* 79°; *Least* 71½°.

Depth below the Surface.	Temperature.	Depth below the Surface.	Temperature.
Fathoms.	Deg. Fahr.	Fathoms.	Deg. Fahr.
Surface.	75·0	900	44·4
25	74·2	1000	42·8
50	73·1	1100	41·1
100	69·0	1200	39·6
150	64·2	1300	38·0
200	61·8	1400	36·4
300	57·2	1500	35·3
400	54·1	1600	34·7
500	50·9	1700	34·5
600	47·7	1800	34·3
700	46·0	2040	33·7
800	45·3	2170	33·5

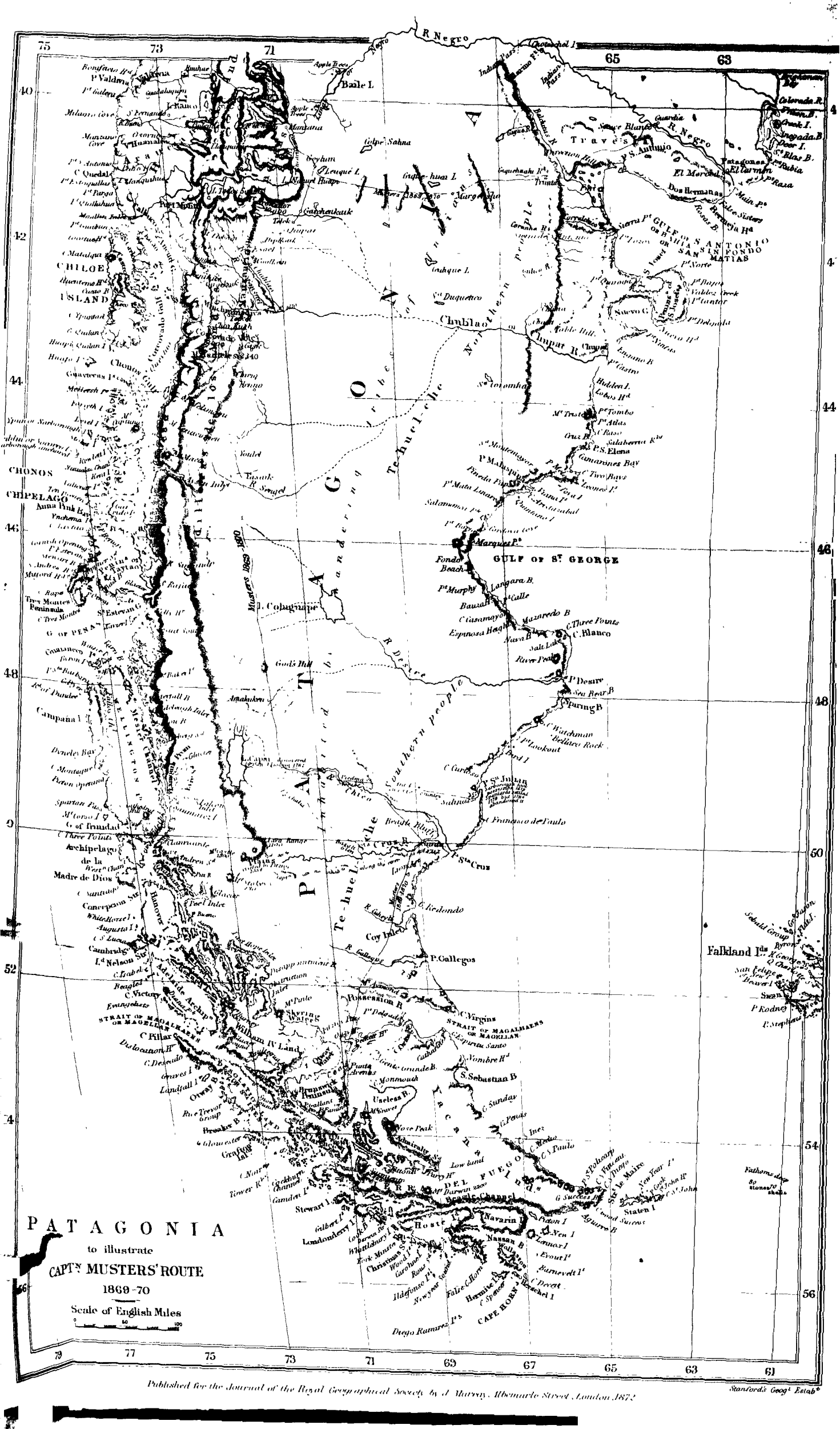
The surface temperature does not appear to make a difference in temperatures below 100 fathoms. After 1700 fathoms, temperature seemed nearly constant at about 33½° Fahr.

BETWEEN KOORIA MOORIA AND ADEN.

Mean of Observations between 22nd February and 6th March, 1868.

Mean Temperature of the Air 78·85° *Fahrenheit; Greatest* 84; *Least* 74½°.

Depth below the Surface.	Temperature.	Temperature.	Depth below the Surface.
Fathoms.	Deg. Fahr.	Fathoms.	Deg. Fahr.
Surface.	76·5	600	52·7
25	75·3	700	51·0
50	73·5	800	49·3
100	67·7	900	47·3
200	60·5	1000	45·4
300	57·4	1100	43·0
400	55·5	1200	39·4
500	54·2	1300	36·0


PATAGONIA
to illustrate
CAPTN MUSTERS' ROUTE
1869-70
Scale of English Miles
0 50 100
Published for the Journal of the Royal Geographical Society by J. Murray, Albemarle Street, London, 1872
Stanford's Geogl Estab.t

III.—*A Year in Patagonia.* By Lieutenant MUSTERS, R.N.

Read, December 13, 1870.

IN the early part of 1869 I was on the coast of South America, and, having some leisure time, resolved to attempt to travel through the country marked in the map as Patagonia, my destination being the Argentine settlements on the Rio Negro.

On the 15th of April I arrived at the Chilian penal settlement of Punta Arenas, situated nearly in the centre of the Straits of Magalhaens, which I proposed to make my point of departure. My first step was to call on the Governor—Commandante Viel, by whom I was most courteously received. Although he did not take a very hopeful view of my chances of ultimate success, he was willing to assist me. He was about to despatch an officer and party to recapture some runaway convicts who were reported to be at Santa Cruz, and he offered me permission to accompany them, promising to provide me with a horse; but as the fugitives might be fallen in with before reaching Santa Cruz, in which case the party would return, it was necessary for me to procure a trustworthy guide, and I engaged for this purpose a Chilian named J'aria, who had previously visited Santa Cruz. It was my intention to endeavour to join a party of Indians at this place, or, indeed, sooner if possible.

My preparations were soon made, consisting chiefly in the purchase of two ponchos and a supply of tobacco. I took with me no instruments except a pocket compass, fearing to excite the suspicions of the Indians. They are jealously apprehensive of Argentine colonization, and would have resented any appearance of surveying or mapping. This must be my apology for the want of scientific observations.

Whilst waiting at Punta Arenas I availed myself of the opportunity to pay a visit to the coal-fields, which exist about six miles from the colony. The coal crops out in the side of a ravine through which flows a small stream. What I saw of the coal did not seem of a very good quality. But the Chilian Government intend to work the bed, and a road was in process of construction through the dense forest under the direction of Don Centeno, a civil engineer. Gold has been found in the bed and on the banks of the same stream.

On the 19th, at sunrise, we started from the colony. Our party consisted of Lieutenant Gallegos, four soldiers, myself, and guide. We took nineteen horses, a tent and provisions, viz., charqui, or dried meat, coffee, biscuit, and meal made of parched corn.

Having followed the coast-line for a few leagues we emerged from the forest, and passing the Rio Chaunco, entered on the Pampas, where the first thing we experienced was a bitter cold wind from the west. We encamped this night on the banks of a large lagoon abounding in wildfowl, and slept comfortably in the tent, although the frost was sharp outside. Next morning we crossed the Cabecera del Mar, a wide inlet running inland some leagues from Peckett Harbour.

We fortunately reached the narrow entrance at low water and found it fordable, thus saving a long *détour* to head the inlet. The crossing has to be carefully effected, as the tides run with great rapidity; as it was we had some trouble with the baggage horses. Next day we entered a valley of considerable extent, about 20 miles long, bordered on the western side by the cliff-like slope of the high Pampa, called the Barranca of San Gregorio, and on the east by a range of low hills. During the morning we came on a herd of guanaco, and gave chase, eventually succeeding in lassoing one. About midday we emerged from the northern end of the valley and came into a different country, open and undulating. After a few more hours riding in the direction of a range of peaked hills lying about N.N.E., we came to the verge of a deep cañon running nearly east and west. A descent of about 200 feet brought us to the banks of a small but deep stream, without trees, but affording plenty of pasture; here we encamped for the night.

I was assured by J'aria, our guide, that this cañon extends from the Cordillera to the sea, but runs in a tortuous course. We resumed our route pretty early, after a delay caused by the not uncommon incident of the horses having strayed, and headed in the direction of a range of peaked hills, all much resembling one another. On arriving in their immediate vicinity we found the plains strewn with scoriæ. The appearance of the mountains was decidedly volcanic, the rocks being tumbled one upon another in wild confusion, and assuming, in many cases, strange fantastic shapes. I afterwards, when in Santa Cruz, heard distinctly the noise of an active volcano, which one of the men, who had visited it on one occasion, assured me lay in about a south-west direction from Santa Cruz three marches distant. I have little doubt but that it belongs to the same range of hills. A little before sunset we encamped by the side of a circular lagoon, in a valley, the descent to which might be 200 feet; it had all the appearance of an extinct crater. Wild owl were numerous wherever there was water, and the plains passed through were alive with guanaco and the so-called ostrich (*Rhea Darwinii*). We also

chased and killed a female puma. By ten o'clock next day we arrived at the valley of the Rio Gallegos, the descent to which is in the form of two successive benches, or plains, a mile and a half in width, with a descent of 50 feet. the river flowing in a broad bed below the second bench. This river attains its greatest height in the months of August and September, when it is impassable except by swimming. We found it easily fordable. We halted early in the afternoon to refresh the horses on the green pasture, and made a fire to attract Indians, our guides not being very sure of their knowledge of the track. We resumed our route early the following morning, and, on reaching the high pampa, observed smoke in a northerly direction. Shortly after an Indian appeared, and, on J'aria and myself riding up, spoke in good Spanish to him and in English to me, at which I was rather astonished. He proved to be a son of the Tehuelche chief Casimiro, who had formerly visited the Falkland Islands in a sealing schooner, where he had learnt some English, and been named Sam Slick by the sailors. He took us to his companions—five in number—who gave us fresh meat. After a social smoke we proceeded, having engaged Sam as guide. These Indians were all dressed in guanaco mantles only, and did not look a particularly intelligent lot of men. One of them, named Henrique, was a Fuegian, formerly captive, but now a doctor or wizard. He travelled apart from the rest of the tribe, with whom he was on bad terms, having been suspected of being concerned in the death of a cacique. Towards dusk we reached the river, which debouches at Coy inlet, called by the Indians Cuheyli, and encamped under the barranca. This river flows in a valley which is reached by a single steep descent, without the bench formation observed at the Rio Gallegos.

On the following morning we crossed the river. Our Indian guide had absented himself for some time, as it turned out for the purpose of lighting a signal fire; and suddenly we perceived numerous Indians galloping up. We accordingly halted to wait for them, and, as they all appeared to be friendly disposed, Lieutenant Gallegos made them a present of charqui and biscuit: the caciques forming their men into a semicircle to receive the present. They were all fine-looking men, more than one of them standing over 6 feet, and one being at least 6 feet 4 inches. The broad chests, and the muscular development of their arms, struck me particularly. Some had their faces painted red or black, and some had children in their arms. They readily recognized me for an Englishman, having seen plenty of sealers of our nation on the coast.

Most were mounted on good-looking horses, without any saddle.

We resumed our route after a short time, and encamped in a recently inhabited Indian camp, where there was both fresh and salt water in springs and small ponds.

On the 24th, after a tedious delay caused by the horses having strayed, which led us for a time to suspect Indian treachery, we started, and rode all day through a country presenting successively, barren plains, hills, and valleys, with lagoons of fresh and salt water at intervals. We met more Indians en route to join the Cuheyli encampment, the women travelling on the top of their goods and chattels. At our bivouac at night we were again visited by some Indians bringing fresh ostrich and guanaco meat, and we passed a lively time round the fire.

Next day, after riding several hours over a peculiarly barren and desolate pampa, the Rio Santa Cruz suddenly came into view directly below us. The sterile nature of this pampa bordering the river curiously resembles that of the Travésia on the south side of the Rio Negro.

We reached the valley by a descent of perhaps 400 feet, and about 7.30 P.M. arrived opposite the Island of Pabon (marked in FitzRoy's charts as Middle Island), where the settlement owned by Don Luiz Piedra Buena is situated. After a little trouble in crossing the ford, occasioned by the tide rising rapidly, and almost rendering it necessary to swim our horses, we were most kindly received by Mr. William Clarke, the manager of the establishment. I found that Don Luiz had left the island, and was probably waiting in the mouth of the river for a fair wind to proceed to Patagones or Buenos Ayres. A messenger was sent to find out; and, a day or two after, a boat arrived with a message that, if I really wished to proceed by land, the schooner would be back in two months for the Indian trade, when it would be easier to procure stores and make terms with the Indians. I met some of the Indians encamped to the northward of the river, who stated that the snow and ice rendered it impossible to travel at present, but that they intended marching northwards in August. My Chilian friends, who had picked up some of the convicts, were very anxious that I should return to Sandy Point with them; however, after a slight consideration, I determined to accept the hospitality offered me in Santa Cruz, and start with the Indians in August, and employ the interim in learning their language, manner of hunting, &c.

On the 29th the Chilian party started on their return journey, and I settled down into the ordinary routine of the

place. We passed our time generally in hunting two or three times a week, sometimes remaining away from the settlement two or three days.

During the month of July the weather was intensely cold, the southern channel of the river being frozen over, and the northern branch covered with floating ice.

SANTA CRUZ.

The present settlement of Santa Cruz consists of three houses, the property of Don Luiz Piedra Buena, and, though well adapted for a colony, is at present only a depôt for trading with the Patagonian or Tehuelche Indians. The houses are situated on an island in the river, which is fordable on the south side at low water. A boat is kept for the purpose of passing to the northern bank. About three miles from the settlement, on the south shore of the mainland, there is a salina from which a considerable quantity of salt may be taken every year. This must have been unknown to Darwin, who states that the most southern salina is at Port St. Julian, a degree to the northward. There are good pastures for sheep and cattle in some of the valleys on the south side, and the soil in the islands is, in parts, of a very rich description. Previous to my stay in Santa Cruz corn had not been tried, but, subsequently, $1\frac{1}{2}$ fanegas = 315 lbs. were sown, and gave a return of 20 fanegas. (Fanega = 210 lbs.)

Towards the mouth of the river large quantities of fish may be caught. They are well suited for curing; they are good after a year's keeping, and might, if ever a good colony is established, form a valuable item in the exports, as there is a good market in the Brazils. A few sheep which were brought from the Rio Negro throve well, and never showed any signs of disease. On the northern side of the river, about a mile from the bank, large quantities of a description of fossil spiral shells are found, many of which appear vitrified, being translucent, and like glass; but they are generally broken into small pieces in extracting them from the rock in which they are imbedded. Some are covered with a sort of white coating, like lime.

The Indian trade consists in exchanging spirits, tobacco, beads, cloth, knives, &c., for ostrich feathers, guanaco, fox, skunk, and puma-skin mantles. Meat in Santa Cruz is obtained entirely by the chase. Large herds of guanaco and droves of ostriches, come down to the banks of the river during the severe weather for food and shelter, where they are easily caught by bolas or killed by dogs. If the hard weather continues for

some time many die of starvation,—a fact that may account for the numerous bones found by Capt. FitzRoy, in his endeavours to ascend the river as far as the Cordillera of the Andes.

This river has its source in a large lake in the Cordillera, and attains its greatest height during the summer months, differing in this respect from the Rio Gallegos, which is then at its lowest. This is probably owing to the later period at which the frozen surface of the lake and the congealed mass of snow accumulated on it are thawed.

START FOR SANTA CRUZ.

In the beginning of August the weather became milder, and the Indians came over to say that they intended to march shortly, unless the schooner should arrive in the meantime with the necessary goods for trade, in which case they would, of course, delay their departure. I had a long talk with the cacique "Orkeke," who was much against my joining them, putting innumerable obstacles in the way, but at length, partly through the influence of Casimiro, who was formerly head chief and was to accompany this party north, he was induced to allow me to join them. Accordingly, Casimiro and myself made arrangements to leave the island on the 9th, and on that day I started with him and "Orkeke" from the settlement, and arrived the same night at the toldos. On the 12th, after two or three slight delays, we marched ten leagues up the valley of the Rio Chico; most of the Indians marched again the next day with Casimiro to join another party under the leadership of the petty chief Camillo, but our toldo remained behind. Casimiro had wished me to accompany him, and warned me that Orkeke was not going north, but intended to keep me in his toldo until by some means or another he could appropriate my revolvers. Orkeke remained absent three days looking for a lost horse; on the third day I got restless, and, catching my horse, started up the valley to join Casimiro, who was already several marches in advance. The first day I did not get far, and used up my small stock of charqui, but on the second accomplished about ten leagues, and halted in sight of the smoke from the toldos. This day I foraged for a species of yam, which grew in abundance; the plant is known by its mass of tiny green leaves, which present the appearance of a small hummock of earth covered with moss; on digging down into the heap, one large and several small tubers are found, which are sufficiently palatable when roasted in the ashes.

During the night a heavy snowstorm came on, and in the morning the trail was hidden by a foot of snow; it was impos-

sible to proceed, so as I was very hungry, having had nothing but roots since leaving the toldo, I determined to hunt on the upper plain. I ascended the barranca to the upper Pampas, and, after some hours hunting, succeeded in catching a guanaco, and was engaged in cutting off some meat, when an Indian, named Tankelow, the chief's brother, came up, having set out in search of me, so we proceeded together and joined Orkeke and the other Indians. Our united party now consisted of seventeen able-bodied men, eight or nine belonging to the southern Tehuelches, and the remainder to the northern tribe.

For a clear understanding of the relations between the different tribes of Indians whom there will be occasion to mention, I may here state that the Tehuelches, or Patagonian Indians, are divided into the Northern and Southern; the Northern ranging over the country extending from the Cordillera to the sea, between the Rio Negro and the Chupat river, occasionally descending as far as Santa Cruz. The Southern occupy the country south of Santa Cruz, down to Punta Arenas. The two tribes are frequently intermixed, and this was the case with my companions.

Besides these, there are the "Guaycurus" on the western coast.

The Manzaneros, whose head-quarters are at Manzanas, are also sometimes called the Warriors. They speak the same language, and in features resemble the Araucanians, to which nation they probably belong: they are less nomadic than the Tehuelches, and possess cattle and sheep.

From the Rio Negro, and ranging as far as the Chupat, are found another tribe, speaking a third language, called the Pampas. These Indians sometimes keep cattle and sheep, but are hunters, and not so civilised as the Manzaneros.

Our party was under the immediate command of Orkeke and Casimiro, who was really the head, having been invested with the command by the Buenos Ayrean government, but owing to his poverty and other personal defects, his authority was practically disregarded. There were besides the men a good many women and children; all these people were housed in five toldos, with their fronts looking to the east on account of the prevalent westerly winds. The toldo has been completely described by FitzRoy, but a sketch of one may not be unacceptable to those unacquainted with it.

It is simply and speedily constructed. A row of forked posts about three feet high are driven into the ground, and a ridge-pole laid across in front of these; at a distance of about six feet a second row five feet high, with a ridge-pole; and at the same distance from these a third row six feet high is fixed. A covering

made of from forty to fifty full-grown guanaco-skins, smeared with a mixture of grease and red ochre, is drawn over from the rear and secured by thongs to the front poles. Hide curtains fastened between the inner poles, partition off the sleeping-places, and the baggage piled round the sides excludes the cold blast. In bad weather an additional covering is secured to the front and brought down over an extra row of short poles, making all snug.

The duty of pitching and striking the toldo, as well as of loading the skins and poles on the horses, devolves on the women, who show great strength and dexterity in the work.

The toldo resembles nothing so much as a gipsy tent, such as I have often seen in our midland counties; and I may add that I found other striking points of resemblance between the gipsies and these Indians.

Next day we marched up the river, which here flowed in a narrow valley, with basaltic hills on each side of curiously fantastic shapes, often presenting the appearance of ruined castles. I observed one with a perforation near the summit looking like a huge window. Our order of march was as follows:—Shortly after daylight the cacique comes out of his toldo and delivers an oration explaining the direction of the march and the programme for the day. After he has finished his oration, the boys and young men fetch up and lasso the horses; on their arrival, the women strike the toldos, load the horses, and, when all are ready, move off in single file; the men drive the spare horses for a short time, then hand them over to the care of the women, and diverge to a neighbouring bush, where a fire is kindled, and the hunt is arranged in the following manner. Two men start off and ride round a certain area of country, lighting fires to mark their course; they are shortly after followed by two others, and so on, till only a few are left with the cacique; these spread themselves out in a crescent, gradually closing in and narrowing the circle on a point where those first started have by this time arrived. The crescent rests on a base-line formed by the slowly-proceeding caravan of women, children, and baggage-horses.

The ostriches and guanacos run from the advancing party, but are checked by the pointsmen, and when the circle is well closed are balled on all sides, two men frequently chasing the same animal from different sides.

The Indian law of division of game is rather good. The man who balls the ostrich first leaves it for the other to carry; it is afterwards divided, the feathers and best part belong to the captor, the remainder to the assistant.

With guanaco, the first takes the best part in the same manner. The lungs, heart, and marrow are sometimes eaten raw.

After the hunting is concluded all disperse in groups, make fires, cut up the game, cook, and eat, and, after a smoke, they mount and go to the toldos, which by this time the women have pitched and arranged.

We made four marches in succession, averaging eight or ten miles each, then rested for several days in a place where the valley of the river was wider and the pasture more abundant. Here the attainment of the age of puberty of one of the girls was celebrated according to custom.

A tent was made of coloured ponchos, in which she was placed. Then mares were slaughtered, and a general feast took place, and the fête wound up with a dance round the fire in the evening performed by the men only. The dancers' heads were ornamented with ostrich plumes, and their bodies with streaks of white paint and a strap covered with bells reaching from the shoulder to the hip. We resumed our march up the river, and travelled, with occasional rests, in a W.N.W. direction till September the 1st, the weather still continuing very cold. On that day we just sighted the snow-clad Cordillera, about 60 miles distant; soon after we crossed the Chico, making our way with difficulty through large masses of floating ice. One or two women were upset, but happily managed to get safe to bank.

Next morning, whilst sitting quietly at breakfast, we heard the clash of knives and a scuffle. All were speedily armed and ready. It turned out that Camillo had been murdered while lying down in his toldo, by one of the Southern Indians, who had then escaped to his friends, and, as they refused to give him up, the Northerners had nothing for it but to fight. Both parties formed in open line twenty yards apart and commenced firing their guns and revolvers, they then came to close quarters and used their swords and lances with effect. The Northern Indians got the best of it, killing the murderer and wounding two or three others. They then stopped fighting, got the horses up and marched, each party, however, remaining armed and travelling separately. This was the first opportunity I had of witnessing an Indian burial. On the death of an Indian, his horses and dogs are all brought to his toldo and killed; his arms, mantles, and all his property, gathered together and burned. During this proceeding the women lament and sing in a peculiarly plaintive manner, both to express their grief and in order to propitiate the evil spirit.

The body, enveloped in a shroud or mantle, is buried in a sitting posture with the face to the east.

The widow and relations put on mourning, wearing black mantles and black paint. The widow also cuts her hair short

and square over the forehead. The time of mourning is uncertain, but the widow may not remarry for ten or twelve months.

The Indians are most careful to avoid speaking of any dead man by name, and in general dislike any allusion to deceased members of the tribe, seeming to consider that they should be altogether forgotten.

After this occurrence we left the valley of the Rio Chico. Having given up an intended excursion to the plains at the foot of the Cordillera for the purpose of catching wild horses, we proceeded northward by forced marches, following a spur of the Cordillera for some days, then crossed it, and encamped in a valley at the foot of the mountains. Here we stopped some days to rest our horses. Afterwards we marched for two days through a barren, rocky district, intersected by deep ravines, with precipitous cliffs, the faces of some of which showed beds of red ochre, visible at a great distance. This desert terminated in a hill, called by the Indians, God's hill, from which their traditions state the animals were to have been dispersed.

The view from this was more encouraging. Rolling plains extended to the north, and the Cordillera rose like a wall on the west side. We marched slowly, with frequent halts, through this country, as streams occurred every few leagues.

Between the 1st and 5th of October we crossed two streams of considerable size, and arrived on the 16th at the wooded banks of a river called by the Indians "Sengel." During these last marches game was plentiful, guanaco and puma abounding. Ostriches were also found in great quantities. On the banks of this river some of the Indians, whilst out hunting, fought again, and one man was killed. Next day Casimiro left us to join the northern tribes, supposed to be five or ten marches distant. We quitted the river and travelled parallel to a range of hills running north and south. On the side of one of them there was a considerable quantity of ironstone, a specimen of which I submitted to Sir Roderick Murchison; and higher up on the same mountain a huge mass of quartz formed a conspicuous object. About ten miles to the northward I noticed cliffs, and in some places whole summits composed of a whitish rock, like marble, with yellow and sparry veins sparkling with crystals, running through it. I was unable, however, to ascertain whether it was marble or quartz. The women here brought into camp large roots closely resembling potatoes. I did not see the leaves, but the roots, though smaller, exactly resembled those I afterwards saw in the more northern country, belonging to a plant, the feathery, fern-like leaf of which springs from a long, slender stem. When not posted as a look-out, I occupied myself in fishing, and after trying a fly in vain, put on a piece of meat, and succeeded in

landing half-a-dozen perch-like fish, with spiny fins, averaging about two pounds' weight. To me this was a great treat, enjoyed almost alone, as the Indians would not touch fish. From this time every river supplied me with fish, including these—a black catfish and the smelt-like "pejerey." All these streams abound with cray-fish, which proved the most tempting bait for the others.

On the 27th Casimiro returned to us, with another Indian, and we hastened on, making rapid marches, and on the 3rd of November joined the main body of the Indians, occupying about forty toldos, situated in a beautifully-watered valley called Henno. A day or two afterwards, another party, composed of Pampas and Tehuelches, arrived from the direction of the Chupat Welsh colony, and were received in due form. The ceremony of welcome is as follows:—Both parties, mounted on their best horses, form into line with their arms in their hands. The chiefs ride up and down the line haranguing, while the men holloa in a peculiar manner at intervals, uttering, "Wap, wap." A messenger or hostage, usually a son or some near relation of the chief, then goes over from each party. The newcomers then advance, form into column of threes, and ride round the other party firing guns and revolvers, shouting, and brandishing their arms. After going two or three times round at full speed, they charge out as if attacking an enemy, then form into line, while the other party go through the same manœuvres. After this the chiefs advance and shake hands, each in turn expressing their welcome with the utmost formality.

We remained in Henno about a fortnight, resting our horses. We then marched to a place a few leagues west, called Chiriq, from a bush which grows in large quantities on the banks of the stream. The leaves resemble those of the blackthorn, and it bears a currant-like fruit. After making several hunts in the surrounding country, we divided into different parties to chase young guanaco. Our division went to the west, and remained until December on the plains close to the foot of the Cordillera, during which time we killed large quantities of guanaco.

On the 6th of December an Indian arrived with letters for me from Santa Cruz, also bringing with him some rum; consequently a feast took place, and we remained four days encamped on the same spot. After the dissipation we broke up into several parties. I accompanied Orkeke, who with two toldos marched straight for the mountains. Our route led through a country devoid of large streams. We passed through several of the basin-like valleys which Darwin describes as occurring on the western side of the Cordillera. The surface

consisted of a thick, yellowish clay, with, occasionally, beds of stone of considerable size. One valley was at least 20 miles in diameter, lying about 50 feet below the eastern pampa. They exactly resembled the dry beds of huge ponds or lakes. We at last arrived at a beautifully-wooded, park-like country, where we remained some days hunting, with varied success. On one occasion I killed one of a species of red deer, also a large fox, resembling the Falkland Island breed.

On the 25th of December we made an excursion into the Cordillera. We traversed a gradually-rising, grassy plain, between the mountains, at last reaching the watershed from which streams, fed by springs and mountain rivulets, flowed eastward and westward. From this point the defile closed in. We travelled about 30 miles westward, keeping, as well as the cliffs and forests would allow us, in the line of the river, and were within about three hours' march of the Pacific, as well as I could judge. We reached a large open plain, free from trees, at the western apex of which was the confluence of the river we had followed and another from the south, the two together forming a large stream. The object of our journey was to kill wild cattle. We discovered some bulls, and chased one, who stood to bay. I dismounted, in order to approach him near enough to use my revolver, but went a little too close to him, and my spur catching in a twig at the moment he charged, I was unable to jump on one side. I fired my revolver when he was a yard off, in his face, hoping to turn him, but he came on, and knocking me down, passed onwards and stood to bay under a bush. Here I had another shot at him, which took effect in his shoulder; but I was obliged to give up the chase, having been badly shaken in the encounter, and having used up all my cartridges. A mounted Indian then tried to lasso him; the bull, however, charged. Indian and horse appeared to fly up in the air, the former pitching on his head in a bush. However, he picked himself up after some few minutes, and rejoined the party, leaving his horse dead and the bull master of the field. Orkeke then ordered us to leave him, and we returned next day to the toldos, thoroughly disgusted at our ill-success. In this excursion I observed large numbers of trees and plants of an entirely different description to those that grow on the eastern slopes. Strawberries and currants were in profusion in many places, as well as yellow violets, a shrub resembling arbutus, azaleas, a description of bamboo used by the Indians to make their lance-shafts, and various others. We marched north on the 27th, and shortly after arrived at Teckel, the place agreed upon by all the Indians we had met with as a rendezvous, where we remained till the end of January, the women being employed

in making mantles of the young guanaco skins. Our prolonged stay here enabled me to study all the manners and customs of my Indian friends, who now looked on me as one of themselves. It will not be amiss to give a short description of the dress and some of the habits of these Tehuelche Indians. The physique of the men is decidedly good; the striking appearance of some of them, as to height and muscular development, has been already described.

Their dress consists of mantles of guanaco skins, ornamented in various patterns with paint—(specimens of which were exhibited)—and chiripas worn round the loins, made of cotton or linen stuffs, obtained from the settlements. Their long hair is confined with fillets, painted in a peculiar pattern, of the threads of unravelled cloth. Their boots are made of the hide stripped from the leg of a horse, and often secured by a gay-coloured garter. They adorn themselves with white, red, and black paint, and indulge, as far as their means allow, in silver stirrups and spurs, and bridles embossed with silver studs. Their proper arms are—the single ball, or *bola perdida*, sword, and lance, to which they have lately added guns and revolvers, obtained in the settlements. The coats of mail, made of cowhide thickly studded with metal bosses, are becoming disused, since the introduction of firearms. Their principal wealth consists in horses and accoutrements, skin mantles, and arms. They are inveterate gamblers, manufacturing their cards out of hide, and staking their possessions on a game at primero, or panturga, but are scrupulous in discharging their debts of honour. They are also very fond of horse-racing. Another favourite amusement is a game of ball, which is played by four or five at a time. The ball is thrown up from under the thigh, and struck with the hand at the adversary, each hit counting so many points.

The women are well formed, and though brown, when young possess very good and ruddy complexions; yet they speedily age from work and hardship, for all the heavy household work falls to their share. They wear a skin mantle over a loose calico sacque, which reaches from the shoulder to the ankles, and, when travelling, a girdle, ornamented with blue beads, and boots resembling those of the men, except that the hair is left on.

Their coarse black hair is plaited into two long tails, artificially lengthened by intervening beads and I think borrowed hair, and ending in silver pendants. They, as well as the men, daub themselves with red ochre and other paints. Their chief ornaments are large silver earrings.

They are married very young, generally at about fourteen or fifteen years; but their marriages are always of inclination. If

the parents make a match contrary to the daughter's will, she refuses, and is never compelled to comply with their wishes. When a youth has courted and secured the affections of a damsel, he sends his friend to her parents and offers so many horses, mares, &c. If his proposals are accepted, on an appointed day, the bridegroom, accompanied by his friends, goes to the bride's toldo, bringing with him the promised presents: they are handed over to the bride's father, who in his turn presents an equivalent, which, in case of a separation, the wife is entitled to take with her. During this ceremony the men shout and the women sing; then the bride is escorted to the bridegroom's toldo, mares are slaughtered and a general feast held, the heart, liver, head, backbone, and tail of the animal being taken up to the summit of an adjacent hill and left as an offering to the gualychu, or evil spirit. Whenever a child falls sick or receives a hurt, which is not mortal, mares are killed and a feast held, to which all are welcomed. This is a sort of thank-offering for the hurt or sickness not having proved mortal.

The Tehuelches have a curious custom of bleeding themselves, the object being twofold—both health and a propitiatory offering to the evil spirit, who is generally believed to lurk outside at the back of the toldo; they also believe in a good spirit, but their active religion is altogether directed to the bad, and they are much influenced by their doctors or wizards. They are very independent and pay little regard to the authority of the chiefs, which depends much more on their personal influence and wealth than on hereditary right. In their family relations they are remarkable for their affection to their wives and children, and I am bound to say that, when not excited, they manifest a good-tempered and generous disposition.

On the 20th of January we broke up from Teckel and made seventeen marches, crossing numerous streams, feeders of the Chupat. Seventy miles from our starting-point we crossed a considerable stream coming from the north-west, the northern branch of the Chupat River, which the Indians informed me flowed from a large lake in the Cordillera. The last five or six marches led us through a very elevated and barren country, the high pampas being strewn with sharp stones, and terminating in steep cliffs, at the bottom of which were grassy plains and water-courses. On March 23rd we arrived at Geylum, a large plain, well watered and with good pasture, lying about 12 leagues east of a large lake. We had previously united with two bands of warrior or Manzanas Indians, under the chiefs Quintuhual and Foyel. These Indians are shorter in stature than the Tehuelches, are nearly white, and cut their hair in a line with their ears. They are armed with lances, &c., own cattle and sheep, and are

better dressed, wearing coloured ponchos, made by their women, who are industrious and good-looking, but dislike travelling, resting a long time in the same places. Their proper country is north of the Rio Limay; but they had come south to hunt young guanaco and catch and tame wild cattle in the Cordillera. With Foyel there were several Valdivians, who spoke good Spanish: they had been catching cattle and were possessed of a herd, numbering over sixty head. This Foyel was an extremely intelligent man: he told me that he wished to be friends with the Christians, also that he was endeavouring to get families of Valdivian Indians to come and cultivate the land near the Rio Limay. We stayed some time in Geylum, waiting for an answer from the cacique Cheoecquè, the chief of Manzanas: it at length arrived, so all the men and some of the women started, leaving a guard to protect and provide for the remaining women and children. Two days' journey brought us to the Rio Limay, which we crossed with some difficulty, the river being very deep and rapid. On arriving on the northern bank we were met by the Indians of Inacayal's tribe, who saluted us in the usual manner. We then bivouacked near the toldos, and were presented with some cattle, which were at once killed, game having been scarce on the journey. Whilst sitting by the fire I received a message, summoning me to a particular toldo, where I found an old Indian, who spoke good Spanish: he invited me to sit down, and then told me that an Englishman, named Cox, had formerly descended the river in a boat, but had been wrecked in the rapids about a mile above the ford we had recently crossed; he then took refuge amongst the Indians of Inacayal's tribe, and ultimately returned to Valdivia. After waiting a day or two for some of our party, who had stopped on the way to enjoy some rum just brought from Valdivia (five days' journey distant), we proceeded towards Manzanas, and about 2 P.M. halted in a valley close to but not in sight of the toldos of Cheoecquè. Whilst warming ourselves and sheltering as best we could from a pouring rain, a messenger dashed up to say that part of Quintuhual's men had had a fight with some of the Manzaneros, and that five were killed, if not more. As these men belonged to our united Indians, great excitement prevailed; guns were loaded and arms got ready for immediate use. Meanwhile Inacayal arrived with a troop of twenty well-armed men, all having the long lance as well as other weapons. A party were sent to the scene of the *mêlée*, distant about 2 miles, to bring off the killed and wounded; meanwhile a message arrived from Cheoecquè with negotiations for a peace. It was determined that we should remain in the valley for the night, keeping a look-out to guard against possible treachery, and proceed at day-

light to the toldos; we accordingly spent the night in making "bola perdida" and shivering round the fires, and started next morning on our best horses, with guns ready for use, and the lancers at our head, for Cheoecquè's. A few minutes' ride brought us into sight of the toldos, where we observed the Indians, under Cheoecquè, forming in line, lances in hand. It was a very fine sight to see these Indians neatly dressed in gay-coloured ponchos, manœuvring like disciplined troops. We had about half an hour of suspense, at the end of which time hostages were exchanged, and we saluted in the usual manner; after which performance a council was held and lasted till sundown. Peace was made, and several resolutions arrived at.

We then dispersed and bivouacked. In the afternoon numerous Manzaneros or Araucanians came round to barter apples and piñones, flour, &c., for knives, bolas, or mantles.

The next day was devoted to festivity: all arms were delivered up and stored in a safe place, then Cheoecquè invited all comers to drink. Many of the Tehuelches got drunk, but fortunately there was no disturbance.

These Araucanian Indians show a greater inclination for a settled residence than the Tehuelches or Pampas, and own herds of sheep and cattle; they are consequently not such good hunters.

We returned to the toldos on the 13th of April, having spent twelve days and nights entirely in the open air during our expedition, in bitterly cold and wet weather. On our return a dispute was with difficulty settled between Foyel's Indians and some of the Tehuelches, which arose out of the latter having helped themselves to sheep and cattle in preference to hunting.

On the 17th all marched eastward for Patagones, turning our backs on the wooded Cordillera of the Andes, that had been our companion so long.

Nine marches, occupying seventeen days, brought us to a place called Margensho. We were obliged to make frequent halts, as a disorder resembling influenza broke out and proved fatal to many of the children. As game were scarce and we were reduced to straits for want of food, this calamity had one good effect, as the numerous mares slaughtered according to custom provided us with a supply of meat.

From Margensho it was determined to send messengers to the Pampa Indians, supposed to be about five days' journey distant; so two others and myself started under orders to proceed to the Rio Negro, and negotiate for cattle, it being further understood that I was to await the arrival of the main body in the settlement. We each took two horses, and after four days' riding over a very desolate country arrived at an encampment com-

posed of two groups of toldos, one belonging to the Pampas, and the other to the Tehuelches, in a green watered valley called Trinîta.

After the usual etiquette observed on arriving as messenger, which consists chiefly in sitting down with a grave face for about two hours whilst the chief interrogates and receives the messages, we asked for fresh horses to enable us to proceed into the settlements still six days' journey distant. This request was refused, some determined to give our horses one day's rest. An Indian named "Changayo" showed me great kindness, and said that my companions should not want for remounts, as he would send horses and people to accompany us. For myself I was well provided. Accordingly on the 14th of May we prepared for a start, but unfortunately some liquor arrived, and we were obliged to stay for the drinking bout; this, however, gave me an opportunity of observing the ceremonial of blessing the liquor, invariably practised by these Indians. Just at daylight the bearers of the rum arrived, and as soon as the kegs and demijohns had been unloaded from the horses, four lances were stuck in the ground, and several of the chief men taking each a pannikin containing a very little spirits, marched round the lances, sprinkling the liquor on the ground, and on the lances muttering some prayer or charm all the time, while the women sang in the Pampa language, which I did not understand. Then four more performed the same round, and the drinking set in and was kept up till 10 A.M., by which time all the liquor was consumed and most of the party were intoxicated.

On the 15th we started, eleven in all, with plenty of horses. Two days brought us to the River Valchitas, which flows at the foot of the ascent to the desert, or travésia as it is called by the Spaniards. On the 17th we made an early start and ascended the slope for about 2 miles, arriving at an abrupt rise of 150 feet, which led to the Travésia. Before ascending, we passed on our left a very large salina, which glittered like a sheet of snow.

Towards evening we reached a small laguna with water the colour of *café au lait*, where we remained for the night.

TRAVÉSIA.

The desolate tract called the Travésia, or desert, extends from the sea coast into the interior for many leagues, and forms a barrier between the Rio Negro and the southern country. It is a high plateau, the surface of which is strewn with very small stones and gravel; the vegetation consists of tussocks of a coarse grass and thick stunty bushes of different descriptions,

such as chañal (white thorn), algarroba, picayin, which is the best for firewood; and "Blackwood," which latter emits a pestiferous smell when burned.

No water is to be met with except thick muddy water in lagoons supplied by the rain, and these dry up with great rapidity, often disappointing the thirsty traveller. Nevertheless, wild horses, guanacos, ostriches, Patagonian hares, and pumas, are found throughout the whole extent of this tract.

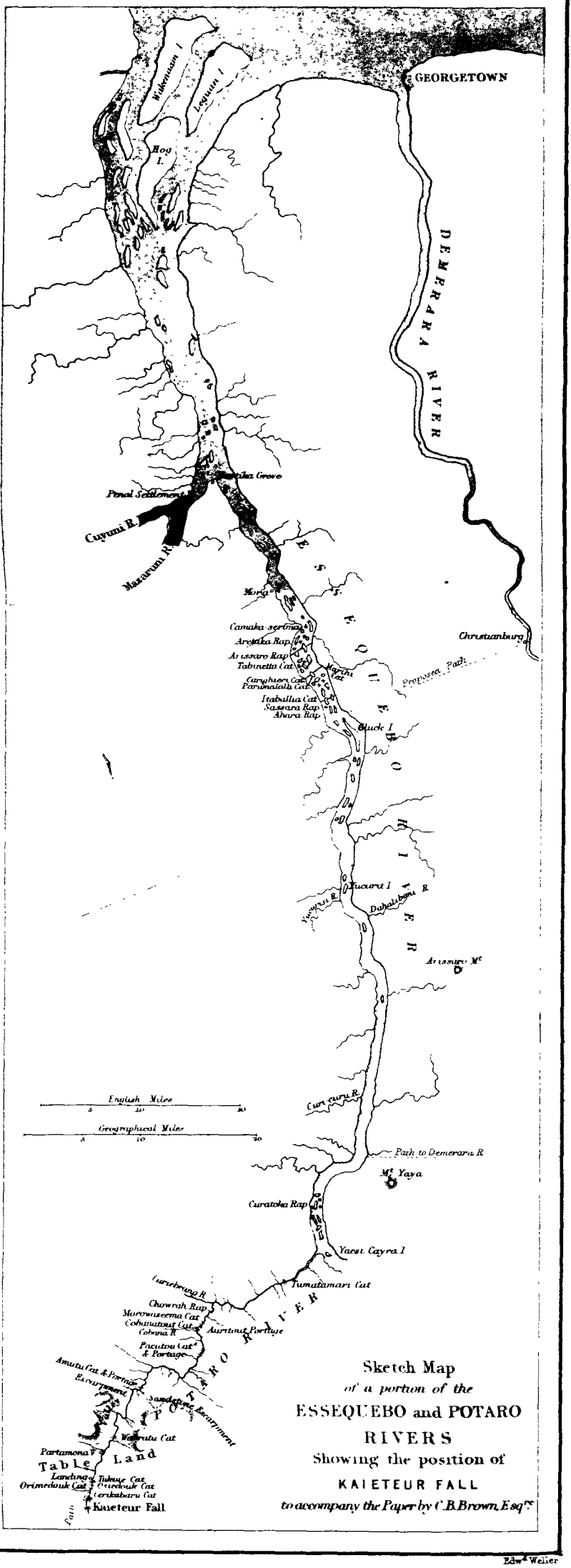
The Indians dread the idea of crossing it unless mounted on good horses. The want of water makes the animals inclined to stray, so that a careful watch has to be kept, and several instances are known of men losing their horses and being starved to death, it being almost impossible to regain the track if once lost. At the end of three days' more travelling through this inhospitable and difficult country, we and our horses were pretty well worn out, and we were very glad when on the morning of the 21st of May we came into view of the Rio Negro. After a halt of two days opposite the Guardia, I proceeded alone to Patagones, and received a cordial welcome from my friend Don Pablo Piedra Buena.

In conclusion, I will give a brief summary of observations on the temperature and weather experienced.

The winter at Santa Cruz was considered to be exceptionally mild. During June, July, and August, there were three heavy falls of snow, and the greatest cold was experienced in July, the thermometer standing at 5° Fahrenheit at 10 A.M. The ice broke up in the Santa Cruz River towards the end of July, but the Rio Chico continued frozen over till September. During this month, while marching towards the Cordillera, we experienced bitterly cold winds with night frosts, and occasional snow-storms. Early in October we had one very warm day, with a hot wind blowing from north-west. The Indians stated that formerly these hot winds were frequent, we, however, did not experience it again.

By their account the summers of the last two or three years had been unusually cold and ungenial. During the rest of October there were slight frosts at nights, and a great deal of rain, but towards the end some fine warm days. While at Chiriq, in November, the weather was warm, with occasional showers, succeeded by bitterly cold south-west wind sand snow-storms. On the 26th of November there was a heavy fall of snow. December set in with sleet and rain, and snow fell on the 20th, *i.e.* at Midsummer. After this we had some fine and warm days.

On December 25th, when within the Cordillera, we entered a different climate, the temperature being about 10° higher than



Sketch Map
of a portion of the
ESSEQUEBO and POTARO RIVERS
Showing the position of
KAIETEUR FALL
to accompany the Paper by C.B.Brown, Esq^re

Edw^d Weller

Published for the Journal of the Royal Geographical Society by J Murray, Albemarle Str London, 1871

that of the eastern plains. During January the greatest heat was experienced, but not above 65°, and even then there were slight frosts. The weather was finer, no rain falling. The weather grew sensibly colder in February, with strong winds, but little rain fell. March set in with hard frost and snow-storms, and heavy gales from south-west. This was succeeded by fine cold weather. At Geylum snow fell a foot deep, followed by severe frosts at night.

In April, whilst *en route* for Manzanas, we experienced snow-storms and hard frosts. On the 17th, when marching to Margensho, the climate became sensibly milder, but we still had hard frosts at night, and occasional south-west winds with sleet and rain.

In the valley of the Rio Negro, though cold winds are felt, the climate is genial—vines growing luxuriantly and wine being made from the grapes. In fact the sensation experienced on leaving the Pampas, where the wind from every quarter blows with chilling violence, and descending into the valley of the Rio Negro, resembles that felt on walking into the hot rooms of a Turkish bath. In fine, the seasons of the Patagonian year, except in the warm valleys, may be described as a long winter and severe spring.

IV.—*Report on the Kaieteur Waterfall in British Guiana.*

By CHARLES B. BROWN.

Read, February 13, 1871.

DURING the last expedition of the Geological Survey, whilst descending the Potaro River, in April, I came quite unexpectedly upon a large fall which the Indian guides called Kaieteur. At the time our provisions were extremely low, from our having made a land journey of nineteen days, during which time all our stores were carried in packs by the men, and were necessarily very limited in quantity at starting. As we were only able to obtain supplies of Cassava bread at each village through which we passed, we then had only that article of food to subsist upon. We had come from the Burro-burro River, *viâ* the valley of the Ireng, round the head of the Siparuni River and on to this, and were striving to regain our boats which we expected to meet us at Tumatamari cataract. Thus we were obliged to hurry forward after only two hours' stay at the head of the fall, during which time I made a sketch of it, and took its elevation above the sea level with an aneroid barometer.

I was much struck with the beauty and grandeur of this fall, and regretted extremely that I could not remain longer to make proper observations of its height, width, &c. I had therefore to content myself with mere estimations, which at best are exceedingly doubtful and unsatisfactory. When we reached the river again at a distance of three miles below the foot of the fall, I of course took the height of it above the level of the sea, and by subtracting the number of feet from that of my last observation, and making some allowances for intermediate cataracts, arrived at the conclusion that the height of the fall was about 900 feet. In the geological report which I furnished to the government on my return to Georgetown, I gave a short account of the fall, and my estimate of its height, to which I added the following remark:—"These measurements I give as the result of my short and hurried investigations, and as such they must be regarded until future explorations determine them with accuracy."

His Excellency Governor Scott, deeming it advisable to have the exact measurement of this fall made known, directed me, on the 24th of June last, to make preparations for a journey to it, for the purpose of making a thorough examination of it with regard to its height and width; stating at the same time that Sir George Young, Mr. Mitchell, and Mr. E. King would accompany me. I therefore at once procured the necessary supplies for a month's consumption for our party, and the number of men which I thought it necessary to take.

Our party left Georgetown in the contract steamer, on the 28th of June, and arrived at the Penal Settlement the same afternoon. Captain Kerr, the superintendent there, very kindly placed the despatch-boat *Lady Woodhouse* at our disposal, which with the small survey bateau, *Victoria*, and two small corials, hired on the following day, formed our means of transport. I engaged fifteen river men who had been with me on former journeys, amongst whom were my captains Peterson and Deeges. These, together with our cook and my Ackawais interpreter, composed the crews of our four boats; eight going in the *Woodhouse*, five in the *Victoria*, and two men in each of the corials.

On Friday, the 1st of July, we started on our journey, and directing our course across the mouth of the Mazaruni River, entered upon the broad waters of the Essequebo, up which we paddled till 5 P.M., reaching a deserted place called Ouyah, where we spent the night. We found the stream running against us all the afternoon from the time we passed Bartika point, at the confluence of the two rivers, there being no ebb or flow of tide, owing to the great height of the river. In the dry

season the tide flows as far up as the foot of the first rapid above Camaka-serima, some eighteen miles above the Grove.

On the following day we reached the above-named place at 10 A.M., and during the afternoon hauled the boats by tow-ropes up three cataracts, through other channels amongst the islands than those I had previously passed; their names were Woodalliquihaha, Moorie, and Itaball. The first-mentioned one lies in a line with Aretaka rapid, but to the east of it. Late in the afternoon we made an unsuccessful attempt to get up a channel in Tabinetta cataract, but failed, owing to the force of the current, and were obliged to camp on an island at its foot. Our progress being so very slow, having to fight our way against the angry stream, we determined not to lose the whole of the next day (Sunday), and so worked up to 11 A.M., thereby getting up Tabinetta cataract.

On Monday we hauled up Marihi, the largest of the whole set of cataracts in this part of the river; and the same afternoon up Itaballia cataract, keeping close to an island, and directly over the spot where I once camped in December, 1868. Only one or two of the many high massive rocks of the neighbourhood were left with their points above water. That evening we camped at the foot of Ahara rapid, now swollen to the dimensions of a cataract.

Early next morning we hauled up this rapid, and along a channel where we usually paddle with ease in ascending, but along which we now had to drag the boats by the low branches of the trees overhanging the water. Getting soon after into water unbroken by rapids, but running with great velocity, we made slow progress against the stream. The clay banks of the river were entirely covered with water, which we found reached as far inland as could be seen; and as we proceeded further on, we found that it was only here and there, in the neighbourhood of low hills, that there were spots of dry land. Along both sides of the river where the banks are low, there are usually low narrow ridges, lying parallel to the river, a few yards from its edge, raised some two or three feet above the top of the bank, which have been deposited in times of flood like the present by the deposition of sediment from the still water covering the land. Next to this, inland, comes level land slightly lower than the banks, which reaches for a long distance back. When the water overflows the ridge it floods the surrounding country to a depth of three or four feet. It was only in a few places that we could find land, and in order to cook our meals were often obliged to camp at earlier hours than we should have done under ordinary circumstances.

On the evening of the 5th we found a resting-place for the

night, only a few yards long, and two inches above water. We sighted first the mountain on the river—called Arissaro—on the 6th, and at 3.35 P.M. on the same day came to Yucurit island opposite Yucurisi creek, and landing at the house of a half-breed Brazilian, determined to pass the night there. The owner and his family had deserted the place,—owing, I suppose, to the height of the river, which covered one-half of the earthen floor, and completely surrounded the house. Fortunately one-half of the house had a staging of Ita palm planks raised three feet above the ground, which furnished us with a dry floor, and made our waterbound condition rather more bearable than it would otherwise have been. Insects abounded here, being driven in by the rising waters, foremost amongst which were termites and small centipedes.

We passed Dahalibani River at noon next day, and in the afternoon experienced a heavy rain and thunderstorm. At 5.30 P.M. we came to the mouth of the Curi-curu River, where we expected to find land, but to our great disappointment all was covered with water. We took the small corials and penetrated a short distance inland, as far as we could get through tangled vines and "bush-ropes," amongst the stems of the trees; but found that the water became deeper the further we went, so we returned to the boats, and had to sleep in them.

On the 8th, at noon, we had a heavy fall of rain; and the same afternoon reached the first rapid in this part of the river, called Curatoka, which was hardly discernible, owing to the height of the river.

At 2 P.M., on the 9th, we entered the mouth of the Potaro River, and found it extremely high, but with very little current, being dammed back by the great body of water flowing down the Essequebo past its mouth. The change in the colour of the water was very apparent, the boats gliding from a turbid stream laden with sediment in suspension, at once upon water of a translucent brownish-black, which had a clean, pleasant appearance. Viewed in a body, the water resembled an infusion of tea in colour, this tint arising from the tannin in it, derived from vegetable matters. At 5 P.M. we reached Tumatamari Cataract, some 5 miles up the Potaro, and found that though a great body of water rushes over it, yet from the water at its foot being so high, it is itself greatly reduced in height, being only 6 or 8 feet at its southern side, and a few feet at its northern. The water of the river washed the foot of the hill, at the end of the portage, so we had to run the boats some distance amongst the trees to get a landing-place, and then camped on the hill-top, on the side of the path.

It will be seen by a perusal of the foregoing, that it took us eight days and a half to reach the Potaro River, instead of five, the usual length of time it has taken to perform this journey on my three previous expeditions up the Essequebo.

Early on the morning of the 10th I went with my captains, and examined both sides of the cataract, selecting a channel on the south side up which to haul our boats. We also crossed to the northern shore, below the cataract, to the spot where we camped on the 28th of April, which was all under water. Sounding at a spot which was then the edge of the river, I found a depth of 13 feet of water. We were all the forenoon engaged in packing up the provisions for our further journey, which was to be performed in the two corials and the small bateau, it being considered impracticable to haul the large bateau up the cataract; and in the afternoon the boats were taken up, and their loads carried over the portage.

Leaving Peterson and three men with the large bateau, and taking thirteen men as crews of the three boats, we started onwards from the head of the cataract at an early hour the following morning; and not having a swift current to contend with, made a good day's journey, passing the Curiebrong River at 3 P.M., hauling up Chowrah Rapid at 4.30 P.M., and camping at the foot of Cobanatout Cataracts at 5 P.M., at the end of the long portage.

Though none of us knew anything about the Cobanatout Cataracts, having on our way down river come across this portage, yet we determined next morning, if possible, to haul the boats up them. Soon after starting we came to the first of these cataracts, named Morowaseema, and unloading the boats, carried the stores along a portage the whole length of an island, a distance of about half a mile; then dragged the boats up, and crossing to the mainland, carried a portion of the things over another portage, 594 yards in length. The boats were then taken up two more cataracts of no great size, the first being called Cobanatout, which is in two steps, with a total height of 3 feet, and the second being called Auritout. If the river was lower, these two cataracts would not present much of an obstruction in the ascent. The river here separates into small channels, amongst a number of small islands; and a group of low hills lie on its northern side. Proceeding on, we passed the upper end of the long portage; and a mile or two further we came to Pacutou Falls. It being late when we reached this place, we camped, after landing everything, to be in readiness for the morrow's work. This fall presented rather a formidable appearance, but we thought that we might be able to get the boats up the four cataracts, of which it is composed.

At 6.30 P.M. on the 13th, we commenced carrying the loads over, all the party working with the men; and in three hours and a half all the stores, &c., were placed at the upper end of the path, at the head of the falls. We then got the boats up, through a narrow channel, to the top of the first cataract, about 3 feet high; and coming to the second, some 8 feet in height, took one of the small corials up with difficulty, and reconnoitred the third. To our disappointment it was found that this cataract was impassable, on account of its steepness, and of the force with which the water rushed down it. The fourth cataract was still more formidable, so we had to return to the end of the portage, above the first cataract, and from thence drag the boats, one by one, up the steep hill to a height of some 50 feet above the river; then along the even path, a total distance of 1078 yards, to where the luggage was deposited, and there launch them. In this work the whole strength of the party was called into action; and everyone working cheerfully and well, rollers or skids were cut and laid, and the boats dragged across on them. It was 4.30 P.M. by the time we had the boats loaded and ready to start again. From the upper end of this portage the flat-topped sandstone mountains are first seen; they form the northern escarpment of the table-land. Continuing onwards, we cleared a small rapid, and bivouacked immediately above it, at my old camp of April 26th. Here I observed that the water was about 3 feet lower than it was at that time.

Starting early next day we continued our journey. At almost every bend of the river fine views of the sandstone mountains were disclosed, uniformly covered with dark green foliage, excepting here and there, where the steep, bare patches of whitish rock formed great precipices. In some places the almost uniform flatness of the mountain-tops was relieved by deep gorges and gaps. We made good progress against the stream, the current not flowing with much rapidity; and by midday reached Amutu Fall, the approach to which, up a long reach of the river, is very beautiful. This fall is divided by an island; and on its eastern side, where the greater body of water pours over, is almost perpendicular for some 15 feet. Unlike the other cataracts mentioned, this one is formed by ledges of sandstone, and is close to the foot of the mountains. The standard barometer here stood at 29·968 inches, temperature 84°, giving a height of only 84 feet above the level of the sea. At this portage, which is only 440 yards in length, there is one hill to haul up from the river, which is steep and very rocky, so that much time was here consumed in cutting skids, on which to run the boats. As usual, all hands set to work, and

by half-past 5 o'clock in the afternoon the boats were all above the portage, and reloaded ready for an early start on the morrow. This fall can never be ascended by boats, on account of its height.

At 7 o'clock next morning, the 15th, we entered the end of the valley, with high mountains on either side, partially shrouded in dense clouds of mist. Soon after the rain began to fall heavily, and did not cease till after 10 A.M., at which time we reached Warratu. As soon as the rain commenced, all the grand views of mountain scenery were hidden by the mist; and on its clearing off, as the rain ceased, some fine cascades pouring down a precipice, on our right hand, were disclosed. Warratu is not a large cataract, its portage being about 100 yards long, so that we found it only necessary to carry the stores and luggage over, and consequently were not detained there any length of time. As the rain-clouds broke away, the sun came out brightly, driving away the mist and fog clinging to the mountain gorges, and thereby disclosing to our delighted gaze a portion of the object of our journey—a view of the Great Fall—far off at the head of the valley, pouring its foaming water over the precipice edge into the depths below, as it has done for ages past. One is struck with awe, and impressed by the greatness of nature's works, when he sees the great power that is here revealed; which through unnumbered ages has been cutting its way, unnoticed, back from the mountain-edge at Amutu to its present position, thereby forming this broad and deep valley. As it receded from its first position, when it probably poured its waters into the ocean then washing the base of the sandstone cliffs, its branch-streams running in at right angles, helped in this great work of denudation, by cutting side gorges and widening the whole valley. Viewed from where first seen, I should say that some 400 feet of it, from the top downwards, can be seen; and about one-half of the width of the top, a bluff hiding the rest. Every now and then clouds of thin white mist from the foot rose up and covered it like a veil, and then passed away to the eastward, the breeze being westwardly at the time; but one cloud I observed always crept along the precipice under its western edge as far as could be seen from here, and is the one that rises from its western foot, which, in early morning, I saw on my first visit.

Before passing the Partamona village we met some Indians, to two of whom I communicated, through the interpreter, that we wanted guides on the following day to the foot of the fall, and as much fresh provisions as they could supply. Soon after

this we reached the "Landing," at 2.30 P.M., at the foot of Tukuie Cataract, about 3 miles from the foot of the fall, at which we landed all the stores, knowing that we could proceed no further in our boats. Another Indian came up to us, and from him I learnt that, on account of the number of small cataracts beyond Tukuie, we would have to pursue our further journey on foot.

Sir G. Young and Mr. Mitchell were anxious to return to town as soon as possible, after seeing the fall, while it was necessary for Mr. King and myself to remain until all the required measurements were taken. Consequently it was arranged that we should all visit the foot of the fall together on the following day; Mr. King and myself remaining there, while Sir G. Young and Mr. Mitchell would return to the Landing and ascend to the head of the fall on the day after, taking the Standard Barometer with them. By this arrangement they could see the views there presented, and at the same time take simultaneous barometrical observations with myself; the times of such being arranged by flag signals. We would then all return and meet at the Landing on Sunday afternoon, and they would leave the next morning on their return journey.

The Indians brought us on the following morning a large quantity of sweet potatoes, plantains, &c., which we bought with beads and knives. By 8 A.M., everything being ready, we started with two Indians as guides, and five of our men as carriers of provisions, &c.; and were accompanied by eleven Indians, who escorted us of their own accord. We traversed the well-beaten path, which leads to the head of the fall, for a few hundred yards, and then struck off to the river, coming out on its western side at Orimedouk Cataract. Here the path ended, and we followed the river's edge, sometimes amongst blocks of rock and boulders, close to the water; at others some few yards in the forest amongst great massive rocks, and having often to cut our way through thickets of tangled vines. At 10.45 A.M. we reached a spot about a quarter of a mile from the foot of the fall, at a point from which its whole face could be seen. This is, perhaps, the best view of the actual fall and precipice, on either side, that can be obtained, and one can here fully realise its immense height. The day was dull and cloudy, and some rain fell soon after we reached the spot, causing a dense mist to hang about the fall. Some of our men lost their way, and taking the wrong path at starting, reached the head of the Fall, and returned to the Landing; only one joined us at 5 P.M. The man carrying the canister con-

taining my sketchbook, &c., also lost his way, and did not arrive till 2 P.M. Meanwhile I chose a good barometrical station 13 feet above the level of the water, and compared the two barometers, so as to get the difference between them. I then commenced a pencil sketch, at which I made slow progress, being repeatedly interrupted by light showers of rain. At 3.30 P.M. Sir G. Young and Mr. Mitchell, who had visited the basin of the fall, left for the Landing camp—the latter carrying the Standard Barometer with him—after settling about our signals and the station for the barometer above on the morrow. All but two of our Indians returned also, so that the party at our bivouac that night consisted of Mr. King, nine men, three of them Indians, and myself. We had poles rigged up and lashed together, under a large flat rock, in a kind of cave; and there slung our hammocks for the night, in this most romantic spot, with a frowning precipice on either side, and the fall in front, with its ceaseless roar sounding in our ears.

Sitting over the fire that night, the Interpreter related to us a tradition connected with the fall, from which it derives its name. The story commences as usual with, "Once upon a time" there lived an old Indian, at a village above the fall—an exceedingly feeble old man—whose feet became infested with Chigoe fleas, to such an extent, that he gave his friends and relatives an immense amount of trouble in picking them out for him every morning. So they determined to rid themselves of the nuisance, and accordingly placed the old man in a woodskin, just above the edge of the fall, and shoved it out into the stream. The strong current hurried him to the brink and swept him over into its foaming water, and he was seen no more. But not long after, strange to relate, his woodskin appeared at the end of a small island, in the smooth stream just below our camp, in the form of a long slab of rock; while on a slope on the right-hand side of the fall, a large square rock, represents his canister similarly petrified. After this tragedy had been enacted, the Indians named the fall Kaieteur, which means old-man-fall. Lying in my hammock that night, I could just discern the fall, through the deep darkness which prevailed, looking like a huge ghostly apparition. The night being chilly and damp, and having no rug to wrap up in, I could get but little sleep, and continually dozed off and woke up at short intervals; every time therefore my eyes opened I saw the fall before me. Just before the moon appeared above the mountain on the left, two bright stars rose in the sky beyond the edge of the fall above, seeming to come out of the very water; and then the first light of the moon rested on its crest, shedding a golden light across it, which had a most beautiful and charming

effect. After this till morning broke all the water was lit up by the moon's rays, and could be seen with great distinctness.

Early next morning, as the sun shone on the mist, on the right-hand of the fall, a beautiful rainbow was produced, reaching from its foot to almost half-way up the precipice. The day was fine and I continued my pencil sketch. At 8.45 A.M. Mr. Mitchell and some of the men appeared at the edge of the head of the fall, on the western side, looking extremely small. We exchanged signals to set up barometers, and soon after signalled each observation; taking five simultaneously, during the interval between 9 A.M. and 10.30 A.M. We next tried to measure the width and take the depth of the river, Mr. King swimming with the line; but the current was too strong and swept the line down stream with such force that we could not manage it. In the afternoon I twice observed that a strong breeze issued from the cave, behind the falling water, driving the eastern edge of the fall outwards, and giving a quarter turn to the bottom of the column of water. Mr. King, the men, and myself walked back to the camp at the Landing, which we reached at 5 P.M., and met Sir G. Young and Mr. Mitchell there. Getting the result of the upper observations, I made a rough calculation from the mean of both, and found to the satisfaction of all that the height came almost up to our expectations. In this I did not allow for the mean difference between the two barometers, which was subsequently taken into the calculation.

On the following morning, the 18th, Sir G. Young and Mr. Mitchell started on their return, in the two small corials with six men, and were accompanied by two Indians in a woodskin. At Tumatamari they were to leave the corials, and descend the Essequebo in the *Lady Woodhouse*. Mr. King and myself started for the top of the fall at 10.15 A.M., taking six men and an Indian with us. The path is good and the ascent gradual for some distance, then becomes rather steep for a few hundred feet to a gully, filled with immense blocks of sandstone, between the interstices of which a small stream runs. From this the path leads up the mountain at a steep angle for a distance of about 400 feet; then the ascent becomes gradual again to the top of the table-land, over 1000 feet in vertical height above the starting-point. It then leads along the table-land in a south-westwardly direction for a considerable distance; coming out of the forest about three-quarters of a mile from the head of the fall, on a small open tract of country. The walking is then over flat rocks, through low shrubs and bush to the head of the fall. We arrived there about an hour after midday, and com-

menced a series of measurements. We tried to measure the height of the fall with a line and weight, run through a pulley over the edge of the precipice; but when over 500 feet had been payed out, the mist given off by the side of the fall completely hid the weight and lower portion of the line from view, and we had to abandon the experiment. We found an old woodskin in a small creek near by, in which I crossed over with a man to the other shore, at a distance of 250 yards above the edge of the fall, carrying the end of a line with us to measure the width; but the line became entangled in the rocks at the bottom of the river, and we had to cast it off and go on without it. I next visited the edge of the precipice on the eastern side, and found that the width of the edge of the fall is 30 feet less than it was when I was here in April, by measuring from it to a rock which I then observed was surrounded by water. On the other side the width is 66 feet narrower than it then was. That evening we encamped in some low bush, close to the fall. Late in the afternoon the swallows (which I mentioned in my last report) came in from all points of the compass in large flights, and here gathering into two or three immense flocks, kept wheeling above us closely packed together, at a height of about 100 yards. I can only convey an idea of the multitude of these birds, by saying that they were in myriads. Every now and then, as the flocks passed above the fall, thousands would swoop down almost perpendicularly, with extraordinary velocity, and passing close over the edge, drop till opposite the great cave; then suddenly change their direction and shoot through the mist on either side into their roosting-places. Just before dusk these birds came down in greater numbers, attracting our attention by the strange rushing sound they produced by their downward flight; sometimes pouring down in a continuous stream for five minutes at a time. Then single birds and small flocks kept arriving till it was quite dark. When a single bird shot down, only a black line marking its course could be seen. I was unable to procure a specimen of one of these swallows to ascertain their size, but as far as I could judge they appear to be almost as large as the common grey plover; and are of a black colour, with a white patch under the throat.

At 6 o'clock next morning the thermometer stood at 70°, whilst the water at the same time was 73°. The great valley below the fall was filled with mist up to 8 A.M., when the breeze sprang up and dispersed it. I continued my observations at an early hour, assisted by Mr. King. We measured a base line of 2·42 chains, and then with a good compass took the angles to a mark on the other side (the rock before mentioned),

from which I calculated the width of the fall, as it was in April last, to be 370 feet.

We then took four observations of the velocity of the current before it passes over the fall, to within 50 yards of its edge. Setting two compasses at two points, 66 yards apart, I directed them both at right angles to the base line. Light pieces of wood were carried out in a canoe some distance above, and allowed to float down. Mr. King observed at one compass while I watched at the other, and timed the floating objects as they passed. I also took five observations with the mountain barometer at the upper station, at the same time as before.

We again took out the line in the woodskin to measure the width of the river at 200 yards above the fall, and were successful. Making the line fast to a tree on the opposite bank, we went back and hauled it in straight, and thus got the true width, viz., 134 yards. The remainder of the day was spent in making a water-colour sketch of the front of the Fall, and of the country from which the river comes, from a spot on the western precipice edge, not far from where the path emerges from the forest. The day was extremely fine, and the sun shining on the spray caused many beautiful rainbows at different periods, one reaching quite from the top to the foot of the fall.

Next morning (the 20th) we sounded the depth of the water at 200 yards above the fall, and found 15 feet 2 inches to be the greatest depth (see Section 3). On the river's edge there are trees upon which the high-water mark has been left, the water having recently, and evidently for a length of time, stood at a height of 5 feet above its present level. Returning to the same spot as yesterday, I finished my sketch, and then we all descended the mountain, and arrived at the camp at the landing at 5 P.M. Just as we left the open table-land above, the rain descended in torrents upon us, and did not cease till after we had got to the camp.

On the 21st, I took five men and an Indian with me, and proceeded to the foot of the fall to take the height of the cataract, from the river below to the edge of the basin. I could not take a barometer with me beyond my first station, on account of the difficulty of carrying it, and the chances of getting it broken, as well as the impossibility of suspending it amongst the rocks. I therefore had to take my aneroid. We reached the barometrical station of the 16th, and continued along the western side of the river, amongst enormous boulders of sandstone and conglomerate, amongst which grew shrubs, low trees, and agaves, all interlaced with tangled vines. Through these we had to search for an accessible track to pass along, and had to clear our way with a cutlass. As we ap-

proached the basin this growth gave place to a coarse moss growing on the soft earth, which covered the flat portions of the rocks, and rendered the walking slippery and difficult. Sometimes we were brought to a standstill by a perpendicular face of rock, and had to retrace our steps and try a new track; at others we had to pass through narrow subways, and under great rocks. It took us about an hour and a half to walk the distance, which I estimate at 350 yards in a straight line, from the barometer station to the outer edge of the basin. As we approached it we felt the breeze coming outwards, and soon became enveloped in mist. At this point the Indian guide refused to go further, and then turned back. The sun cast its rays upon our backs, and produced small rainbows in front of our faces, which were most dazzling, and almost prevented our seeing the way in passing over deep fissures amongst the rocks. At the basin the mist and spray completely surrounded us, quite hiding the sun, like a dark cloud. Here we had to take shelter behind the rocks from the blinding storm of mist and rain which assailed us, driven outwards by the hurricane produced by the falling water, and through gaps witness the strange scene before us. The water in the basin most truly resembled a huge boiling cauldron, to which I before likened it, being lashed into great irregular waves, whose crests were blown into spray, and as they drove outwards in an irregular semicircle were dashed against the rocks in front, and the walls of the cave on either side, beating over one rock that I am sure was 15 feet high. The foot of the descending column of water was rendered indistinct by the mist, but great fleecy masses of white foam spurted upwards many yards high in clouds mixed with spray and mist.

Standing there, I imagined that it exactly resembled a sea storm raging on a rockbound lee coast. When I went in amongst the reeking wet rocks to the storm, I left the sun shining brightly, and the neighbouring forests unstirred by any wind whatever. Returning again, I came out of the mist into the sunlight, and by the time I reached the barometer station and looked back, I could hardly believe that such a disturbance of the water in the basin as I had witnessed still continued.

The aneroid gave unsatisfactory readings, from the mean of which the difference of level between the edge of the basin and the barometrical station below is 68 feet. To this, 13 feet, the height of the barometer station above the level of the foot of the cataract must be added, which gives 81 feet as the total height of the cataract.

At the lower end of the smooth water below the fall, at a distance of three quarters of a mile, there is a long sloping

cataract, for which the Indians with me said they had no name. The roar of this cataract drowns that produced by the great fall, on account of its proximity to the path along which we went; so that the sound of Kaieteur can only be heard at a distance of half a mile from its foot. I may here remark that at about a mile above it on the river, I could just hear it on my approach in April last. Next to this come three smaller cataracts, between it and Tukuie cataract, which are respectively called Serikabarn, Orimedouk, and Osiedouk. At the first-mentioned one, on the eastern side of the river, there is a beautiful large cascade, part of which falls perpendicularly for some 200 feet. Near this cascade there is an enormous stone pillar on the edge of a precipice, with two flat slabs on top, resembling a gate-post. There is also a fine cascade opposite the landing-place.

Having taken all the necessary observations, and completed the work for which this journey had been undertaken, we determined to start upon our return on the following day.

I made inquiries about the upper fall on the Potaro from some Indians who had just come down from it, and from their description, it is a long sloping succession of cataracts, which, taken together, give a height almost as great as Kaieteur.

From similar inquiries, I learnt that the fall on the Curiebrong, the existence of which I pointed out in a former official report, fully realised all my expectations, being, according to the Indian account, quite as high as Kaieteur, and also perpendicular. Its Indian name is Amailah. Feeling satisfied as regards the truth of this account, I think I may without hesitation lay claim to the discovery of the existence of this fall. I also think it not improbable that the Semang and Meruné rivers, coming from the same sandstone table-land, have similar falls upon them.

We left the landing at 8 A.M. on the 22nd, in the bateau *Victoria*, accompanied by six Indians in woodskins, whom I hired to help in hauling our boats over the portages. In running down Warratu cataract on its western side, we met with an accident, which might have had a very serious termination. As the boat shot over and cleared the dip of the fall at full speed, she struck on some hidden rocks with such force, that the bowman, who was standing up at the time guiding the bow with his paddle, was thrown overboard; grasping the gunwale of the boat he saved himself. There we were, the boat grinding and thumping on the rocks in the midst of waves and foam, and I had little hopes of the boat's holding together. The men all jumped over, and so kept her from broaching, and with extreme difficulty we got out of our perilous situation. By the

time we reached the shore the boat was half-full of water. Unloading, we found that the bottom mid-plank was completely shattered, and water was pouring through in many places. These leaks we stopped with tallow and oakum, after hauling the boat up. Continuing on, we hauled over Amutu portage, and camped about half-way between it and the next set of cataracts.

We reached Pacutou portage at an early hour next morning, and carried everything over by noon. In running the boat over on skids, the shattered plank burst through in two places, and we experienced considerable delay in patching it up by first caulking, then spreading osnaburg over it on the outside, upon which we nailed pieces of wood. We reached Cobanatout cataracts at 2 P.M., and lowered down all but the last one, named Morowaseema, where we unloaded, put skids on the rocks, and ran the boat a distance of 10 yards on them before launching it at the foot. We encamped at the foot of Chowrah rapid, and, the following day being Sunday, we remained there all day. The river was here very much lower than when we came up, and was falling gradually.

Next morning, 25th, we ran down the river till we came to the Curiebrong, up which we turned. We went two days' journey up it, and finding that our stores would not hold out if we went further, returned, and reached Tumatamari cataract at 2 P.M. on the 28th, lowered down our boats on skids, and camped below it on the northern side. The river above the cataract was two feet lower, and below the fall four feet lower than when we went up on the 11th.

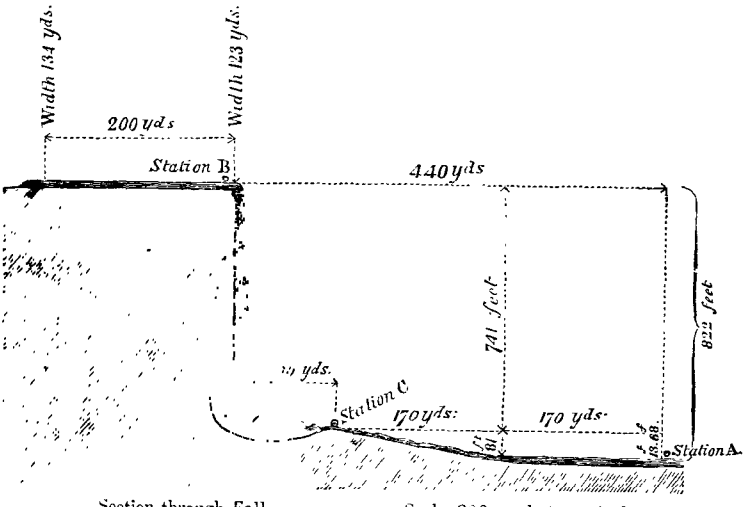
Starting at 6 A.M. next day, we reached the Brazilian house on Yucurit island at 4.30 P.M., and remained there for the night. The water there had fallen a good deal, and land was now everywhere to be found. The mosquitoes being very numerous, prevented all from sleeping, so that at 4 o'clock next morning we were glad to leave the place and continue our journey. We ran all the falls that afternoon except Marihi, and part of Tabinetta, which were evaded by running down side channels. Having no tide or wind below the falls to contend with, we made a good day's run of 46 miles, arriving at Bartika Grove at 5 P.M. on the 30th. Here we were kindly received by P. Grant, Esq., the stipendiary magistrate, and next day went over to the Penal Settlement, where we became the guests of Captain Kerr, who extended his generous hospitality to us.

We left the Settlement on Monday morning, August 1st, in the contract steamer, and arrived at Georgetown in the afternoon, after having been away for 35 days.

In giving an account of this fall, only a slight idea of its beauty, or of that of the scenery which surrounds it on all sides, can be conveyed. I will now give its actual dimensions, as I made them out, together with an outline of its geological structure.

Kaieteur Fall, as I have placed it on the map, from my sketch survey of the Potaro River, taken from its mouth up, is in 59° 19′ W. long. and 5° 8′ N. lat. It is produced by the Potaro River flowing over a sandstone and conglomerate table-land into a deep valley below, with a total fall of 822 feet. For the first 741 feet the water falls as a perpendicular column into a basin below, from which it continues its downward course over a sloping cataract in front, 81 feet in height, and through the interstices of great blocks of rock, to the river bed below. The head of the fall is 1130 feet above the level of the sea. (See Section No. 1.)

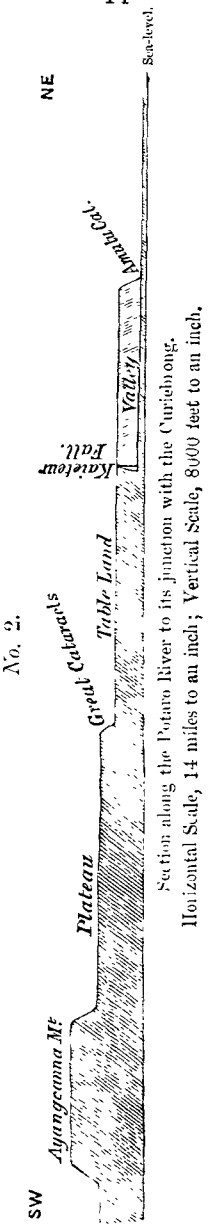
No. 1.



Section through Fall. Scale, 200 yards to an inch.

The accompanying Section (No. 2) will enable the reader to understand the way in which this fall has been produced, and also give some idea of the nature of the table-lands. The river rises in Ayangcanna Mountain, some 40 miles to the south-west of the fall, and flows from an uneven plateau down a succession of immense cataracts, above Enapowou village, to an extensive table-land. At one time it must have run over the edge of the table-land near Amutu Cataract, but, during the lapse of time,

it has cut its way back to its present position at the upper end of the valley. The river comes due north for a mile or so before reaching the head of the fall, with no great force of current, and has a smooth surface; but at a distance of about 200 yards from the fall it seems to hasten forward with greater speed, and becomes slightly rippled, breaking into little patches of foam here and there as it nears the edge, and then rushes over. As it curves over it is of a dark reddish-brown colour, in its deepest portions, through which can be seen patches of foam forming beneath, and passing out to the surface of the water, changing it into a heavy column of foam of a white colour, with a slight reddish tinge. This may be described as descending in seven great systems of inverted rockets of foam, so close to each other, both vertically and laterally, that no actual break takes place between them, so that the whole river falls in one great continuous whitish column of jagged foam. These seven systems are strikingly observable from the contrast of colour presented between them and their interspaces; the foam of the latter, joining edge to edge across, being of a pure white colour, and of much thinner substance than the former. Where this column of water beats into the basin below, dense masses of foam spurt upwards in all directions, while the actual contact is rendered indistinct by clouds of mist.



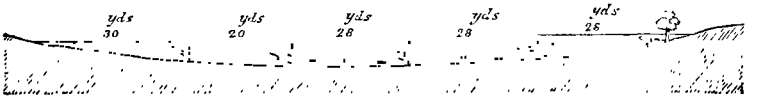
The water then flows away as a cataract, over and through the interstices of the great boulders, which form the outer edge of the basin, into the river below, and runs onwards with a strong current of a dark, brownish-black colour. The water in the basin is also of a deep brownish colour, and the rocks surrounding it are all stained of a similar tint. In the shallow portions of the lip of the fall the reddish colour of the water is lost the moment it begins to fall. The western side of the descending column of water forms an even edge, but on the eastern side the water

falls thinly from the top, forming thin rockets, which shoot out into thin spray and mist, and widening as they slowly descend, form a beautiful veil of grey mist over the edge of the cave, on that side, whose outline can then be hardly traced. This mist rises to the top of the fall, and keeps moving outwards along the side of the precipice, and soon becomes invisible vapour. When the sun is shining, a most beautiful rainbow is formed, which reaches from the top to the foot of the fall, and moving outward with the mist gradually fades away; and with each accession of mist a new one is formed. The edge, or lip, of the fall is even on the eastern, but has a second ledge on the western side, and some rocks protrude above water there, now that the river is low. It is curved, or angled inwards, and at the angle the greatest body of water flows over.

The width of the river, at a distance of 200 yards above the edge of the fall, is 134 yards, and at the edge itself, is 123 yards.

The depth, at the same place, was 15 feet 2 inches, when measured—the level of the water then being 5 feet below its highest level when in flood. The accompanying section (No. 3),

No. 3.



Section across the River, 200 yards above the edge of the Fall.

gives its depth at various distances across. There are no means of measuring the width and length of the basin, but I have estimated them at 200 and 100 yards respectively.

The velocity of the stream, just above where the greater body of water passes over, is 4·09 miles per hour, and 3 miles per hour between that and the western shore.

The lip of the pool or basin is formed by the meeting of two sloping piles of rock, banked against the foot of the precipices on either side, the ends of which meet almost together at the middle of it. The cave behind must be of immense size, from the glimpses of it on both sides. The fact of the enormous flocks of swallows that find a roosting-place and home there, also leads to this conclusion. It is now inaccessible, both of the precipices on each side of the fall being perpendicular at their foot, and washed by the water of the basin. On both sides of the fall the beds of sandstone form even, perpendicular precipices of grey and reddish rock, void of trees, but as they curve round away from the fall they become sloping and tree-covered.

The vegetation about the immediate neighbourhood is very beautiful. All the surrounding country is covered with dense forests, with the exception of a small savanna, close to the western side of the fall. On this savanna are scattered groves of low trees, with patches of grass, and bare stretches of level rock. The vegetation on this is very curious, there being numbers of small flowering grasses and rushes, while representatives of the Orchid family, of singular beauty, mosses, and ferns grow in great luxuriance over it. Amongst the *Orchidaceæ* are three species which I imagine are quite unknown elsewhere. They grow on decayed wood lying on the rocks, have large roots, and grow very high. Their flowers are large, delicately scented, and in form resemble those of the Cattleya. A large species of Agave grows in great numbers here. Its leaves are more of a yellowish-green colour, and their points are of a rounder form than those of the *Agave vivipara.* Growing along the track from the Landing to the foot are great quantities of ferns and mosses, and on the rocks close to the edge of the basin are small scarlet bell-flowers and a fine sack-shaped orchid. All the rocks near the basin are covered with a coarse moss, and beyond, on the rocks washed by the waves, this growth gives place to a small water plant. Small clusters of dark green shrubs cling in patches to the lower portion of the precipice, on either side, and look like ivy on a castle wall. A long kind of grass grows in the water on the western edge of the lip.

The scenery of the great valley below, when viewed from near the head of the fall, is extremely fine. Late in the afternoon, when the sun is sinking in the west, great shadows are cast across it, which have a magnificent effect; and the colouring is then very beautiful, the end of the valley being lit up by the golden reflection of the sky over the plain beyond, and the strips of river winding in the depths below, look like little bands of silver. Viewed from this spot, none of the bare precipices on the valley side are disclosed, but all appear to be covered with a rich dark green clothing of trees.

From the small savanna, looking south and south-west, the mountains of the first plateau are seen in the distance; as also are Cowatapeur and Salieng (two flat-topped mountains), far off in the west.

With regard to the geological structure of Kaieteur Fall, I may here mention that the table-land over which the Potaro River flows is composed of sandstone and conglomerate beds, belonging to the upper portion of the great Sandstone formation of Guiana. In my last report I have given a description of the lithological characters of this formation, and have there stated that it is probably the equivalent of the New Red Sandstone.

The lower portion is not here represented, and the sandstone rests upon the Quartz Porphyry. The upper beds of this rock are here extremely hard, and are formed of a coarse pebble conglomerate lying in a synclinal curve, in which the river runs, just as it passes over the precipice. This conglomerate is some 20 feet in thickness, and is underlaid by beds of reddish-grey sandstone, which are not so durable as the conglomerate. It is owing to these circumstances that the fall is of a perpendicular form, for the great hardness of the conglomerate resisting the action of the water for a longer period than the underlying sandstone, is left as a protruding ledge; while the wash of the column of water cuts away the softer sandstone below.

The back splash of the fall has cut out the great cave behind, and as the conglomerate ledge above breaks away from time to time, as it must do, and the column of water is thereby moved back, so in the same ratio must the cave be cut back, and the perpendicular form of the column preserved. These conditions will probably remain in force for ages to come, so there is no reason to anticipate the destruction of the vertical portion of this beautiful fall.

There is a great fault in the strata on the eastern side of the precipice, which has produced a great change in the dip of the beds, beyond the line of the fall.

The conglomerate is composed of water-worn blocks and pebbles of quartz, cemented together by a white clay with quartz grains, of the same reddish-grey material as constitutes the sandstone, and of such great hardness, that the embedded quartz splits evenly in two, with the fracture of the rock. Besides quartz, these contain pebbles of jasper, quartz-porphyry, and sandstone.

The sandstones vary much in durability, texture, and colour, and invariably exhibit lines of false bedding.

There is a layer of trap-rock not far from the Landing, on the hill-side, crossing the path that leads to the top.

I feel sure that the elevated tract of country about the head of the fall is extremely healthy, and that a journey to it, and a short time spent there, would be found a beneficial change to those who reside on the lowland along the coast.

The Indians say that in the dry season the river becomes very low, and, consequently, the fall narrows greatly. In the month of October it reaches its lowest point, and then the fall is only about one-third of its full width. They say it then falls in a continuous column as at present. After October it rises with the autumnal rains, and, for a month or two, is at its full width; it then decreases till March, and again is filled up by the spring rains.

A small sum of money judiciously expended in improving the portages, and in making a pathway to the foot of the fall, would reduce the time of the journey there and back considerably. The Indians living near by, if directed and paid, could easily fell trees amongst the large rocks, flatten their upper sides, and lash hand-rails to them; whereby the walk from the landing to the edge of the basin would be greatly facilitated. Small thatched sheds could be erected at the various camping-places to protect travellers from rain and dew at night.

The nearest and best route is, undoubtedly, the one by which we travelled; but a more convenient way might be opened up for those who wish to evade the cataracts on the Essequebo River. This could be done by cutting a road, 18 miles in length, from Christianburg due west to the Essequebo River, and parties could then ascend the Demerara River to Christianburg in the steamer, and cross over to boats kept on the Essequebo above the Ahara Rapid.

To this report I have attached a map, which is the one used by the Survey, and was traced from Schomburgk's large map. I have added my sketch survey of the Potaro River to it, so that the position of the fall can be seen at a glance. They are reproduced on a smaller scale in the accompanying sketch map.

CALCULATION OF TOTAL HEIGHT OF THE FALL, BY SIMULTANEOUS OBSERVATIONS OF STANDARD AND MOUNTAIN BAROMETERS.

Standard Barometer (Casella's No. 566) at top of Fall, Station B, 5 feet above level of river.

Mountain Barometer (Baker's) near foot of Cataract, Station A, 13 feet above level of river.

		At sea level.		Foot of Fall.
Difference of barometers	Standard ..	30·056	..	29·650
	Mountain ..	30·038	..	29·626
		·018		·024

Mean of difference to be added to Mountain Barometer, ·021

Time.	Standard Bar.	Attached Therm.	Mountain Bar.	Attached Therm.
1st Observation, 9 A.M.	28·868	74°	29·714	73°
2nd „ 9.10 „	28·900	74°	29·708	73°
3rd „ 9.30 „	28·892	75°	29·706	74°
4th „ 9.45 „	28·888	76°	29·709	75°
5th „ 10.30 „	28·888	76°	29·711	75°
	5)144·436	5)375°	5)148·548	5)370°
	28·887	75°	29·709	74°

Mean of Standard Barometer .. .. .. 28·887 .. 75°
„ Mountain „ 20·709 + ·021 = 29·730 .. 74°

29·730	29·730	75° = 944·7 in Table.
28·887	28·887	74° = 942·9 „
2)58·617	·843	2)1887·6
29·308		943·8
		·843
		28314
		37752
		75504
		795·6234
		30

29·308)23868·7020(814 ft.
234464
42230
29308
129222
117232

Total height by observations .. .. .. 814 ft.
Height of Standard above river 5 ft.
„ Mountain „ 13 8
„ Fall and Cataract = 822 ft.

CALCULATION OF HEIGHT OF CATARACT BY ANEROID BAROMETER.

Station C, 5 feet above the edge of basin.

Time.		At Station A.	At Station C.
1st Observation ..	noon ..	29·748 ..	—
3rd „ ..	3.30 P.M. ..	29·660 ..	—
2nd „ ..	2.30 ..	— ..	29·620
		2)59·408	
		29·704	

29·620 = 337 feet.
29·704 = 264 „
73 „

Height of Station A above river = 13 feet.
„ C „ = 5 „
8 „

Height of Cataract = 73 + 8 = 81 feet.

TOTAL HEIGHT OF FALL.

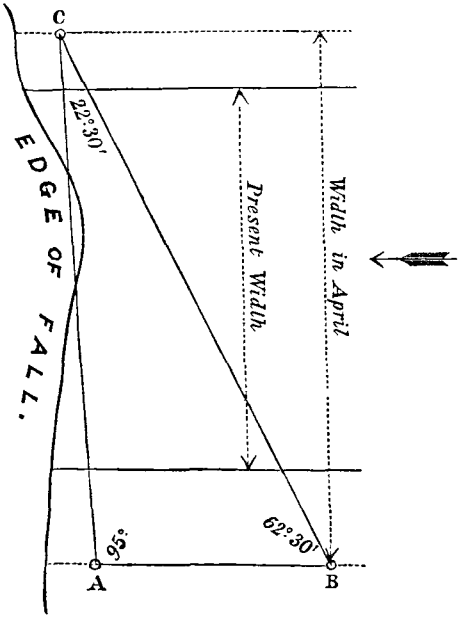
Height of Fall .. .. 822 feet.
„ Cataract .. .. 81 „
Height of perpendicular portion 741 „

CALCULATION OF WIDTH OF EDGE OF FALL.

Base line A B = 159·72 feet.
∠ C = 22°·30′
∠ B = 62°·30′

Log. Cosec. C = 10·4171603
„ Sin. B = 9·9479289
„ A B = 2·2033593
feet. 2·5684485
A C = 370·21 = 2·5684481

Feet.
Width of Fall at edge = 370·21



HEIGHTS ABOVE THE SEA LEVEL, TAKEN WITH THE STANDARD BAROMETER.

Foot of Tumatamari Cataract	65 feet.
" Amutu ditto	84 „
Landing Place	196 „
Top of Kaieteur Fall	1130 „
Foot „	308 „

I have taken the following quotations from Sir John Herschel's 'Physical Geography' for the purpose of allowing the reader to draw his own comparisons between the chief waterfalls of the world and Kaieteur.

With regard to Yosemite and Riukan Fossan it will be seen that their exact width is not given, one being mentioned as being the "width of the Thames at Richmond," and the other "a large river." The height also of the former seems to have been taken by guess, and the words "unless exaggerated" cast some doubts upon the truth of the statement.

"The loftiest waterfall in the world (unless exaggerated) is to be found in the Yosemite valley, in Mariposa county, California, where a river as large as the Thames at Richmond makes a single leap of 2100 feet perpendicular, the total height being 3100 feet.

"The communication along the chain of lakes is broken between Lakes Erie and Ontario by the stupendous Fall of Niagara, the largest and most magnificent, though far from the highest, in the world, the total breadth of river (which is divided into two great cataracts by Goat Island) being 3225 feet, with a descent of 162 feet in one fall, and 149 on the other."

The Victoria Falls on the Zambesi River are thus spoken of: "The falls referred to are, perhaps, the most striking after Niagara, which exist. The river, 1000 yards in breadth, is suddenly swallowed up in a narrow perpendicular cleft, 100 feet deep" . . . "in which the river takes its new course compressed in a deep channel of 15 or 20 yards."

"The most notable European waterfalls are those of the Rhine at Schaffhausen, not lofty—being only 70 feet in height—but very picturesque; those of the Velino at Terni, and the Anio at Tivoli, both artificial, but of exquisite beauty; that of Riukan Fossan, where the Maanelvan, a large river flowing out of the Miosvatn Lake in Tellemarken, in Norway, springs 946 feet at a single leap; the Glommen Falls, and those of the Moxa near Stav, in the same country. The Falls of the Clyde in Scotland are not wanting in grandeur or beauty. Those of Gavarnie (1400 feet) in the Pyrenees, and of the Staubbach (1004 feet as measured barometrically by the writer of this article) in Switzerland, are mere rills, remarkable only for their height, in which, however, both are surpassed by that of the Orco, a stream which springs 2400 feet from Monte Rosa, on the Italian size of the Alps, and of which some further account would be desirable."

CHARLES B. BROWN.

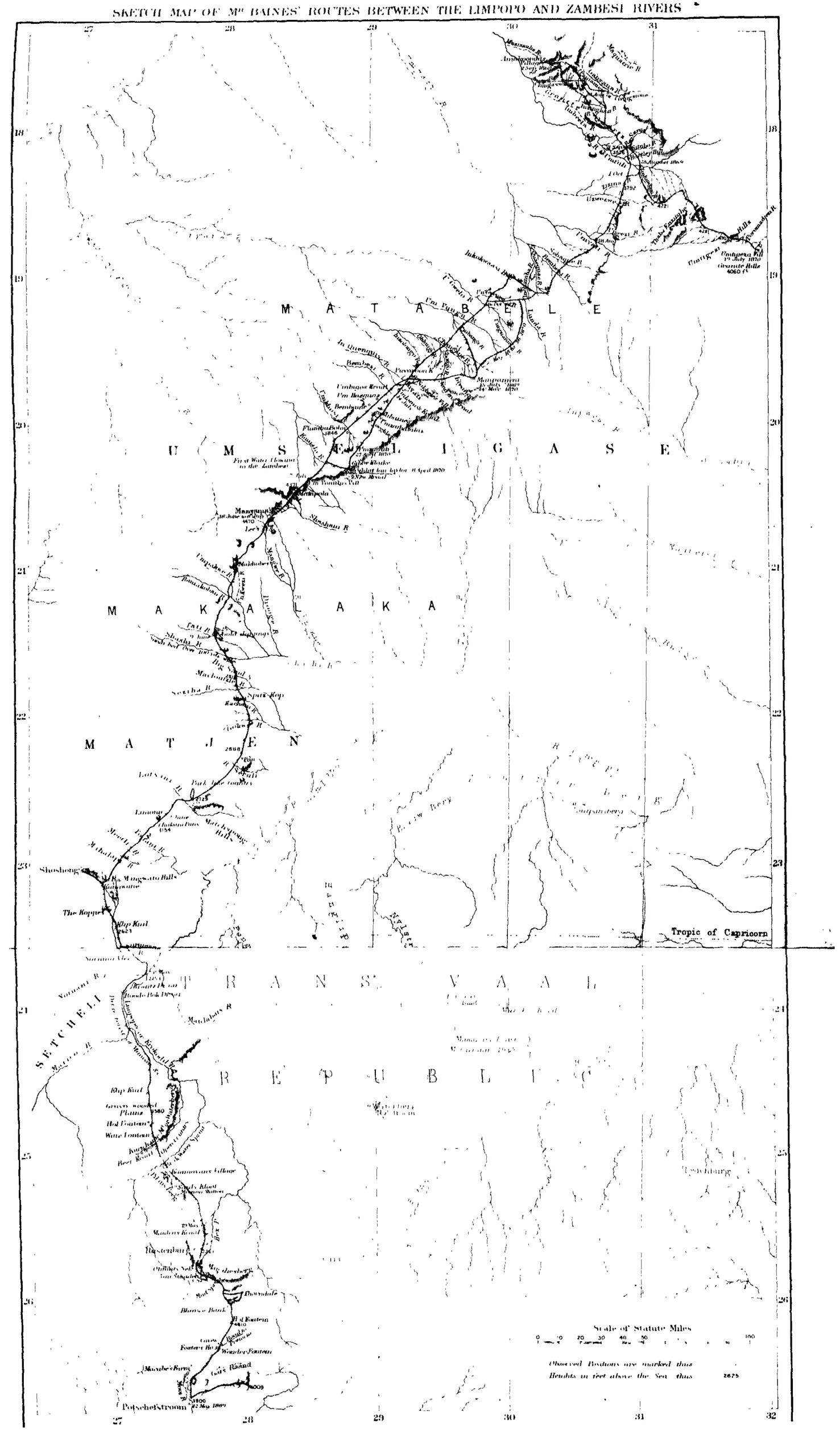
Georgetown, Demerara.
August 13th, 1870.

V.—*Account of Mr. Baines's Exploration of the Gold-bearing Region between the Limpopo and Zambesi Rivers.* Prepared from Mr. Baines's Journals, by ROBERT JAMES MANN, M.D., F.R.G.S., F.R.A.S., &c.

Read, March 13, 1871.

AT the close of the year 1868 arrangements were made by a small association of gentlemen in London for carrying out a careful exploration of the district between the Limpopo and Zambesi rivers, in South Africa, which had then recently been visited by the German traveller Carl Mauch, with a view to determine its actual character and value as a gold-bearing region. Mr. Thomas Baines, the gentleman already so favour-

SKETCH MAP OF Mr BAINES' ROUTES BETWEEN THE LIMPOPO AND ZAMBESI RIVERS



250 geographical miles very nearly following the central line of watershed between the great rivers.

In order to render the geographical characteristics of this elevated gold-bearing region more readily intelligible, a brief sketch of the general contour of the land of this part of South Africa will be useful. From the 29th parallel of south latitude, near to where it is intersected by the 24th meridian of east longitude, the Great Orange River runs approximately westwards to the Atlantic Ocean for 400 geographical miles, forming the frontier of the British territory of South Africa through its entire extent. To the eastward of this point the Orange River forks, until the end of each branch of the fork is barred by the Drakenberg Range, or rather ledge, of mountains. The land between the two branches of the fork, which are the Vaal River on the north, and the Orange River on the south, is the Orange River Sovereignty, and the country of Moshesh, which has been quite recently taken under the protection of the British Government. Seawards, or eastwards, of this part of the Drakenberg Range is the colony of Natal. Northwards, the Drakenberg Mountains push up the channel of the Limpopo River into a broad horse-shoe sweep, in the interior of which lies the Transvaal Republic, bounded northwards and eastwards by the Limpopo for some 300 miles. The eastern boundary of the Republic is completed southwards by the Hart River,* whose sources almost mingle with those of the Marico, which runs down into the Vaal, some 70 miles above the confluence of that stream with the Orange River. The newly-discovered Diamond Region lies as a kind of basin around this confluence, extending some distance upwards along both the Hart River and Vaal River, and downwards along the main channel of the Orange River. As the Orange River Sovereignty lies between the Orange River and the Vaal River, the Transvaal State lies mainly between the Vaal and Hart Rivers, and the Limpopo. The coast region northwards of Natal, and seaward of the Transvaal Drakenberg, is occupied by the country of the Zulu and Amaswaze Kafirs. Where the northern point of the Drakenberg pushes the Limpopo the furthest to the north, that river sweeps broadly from east to west almost along the 22nd parallel of south latitude, both its sources and its mouth being near the 25th parallel. This northernmost sweep of the Limpopo is divided from the Zambesi by a breadth of about 360 geographical miles.

When Carl Mauch first visited this region he made his way into it by crossing the Limpopo, near the north-eastern corner

* These boundaries are considerably altered by the annexation of the Diamond Fields by the British Government.—[ED.]

of the Transvaal, and by then traversing obliquely the wild district to the north of the great river. The more easy and natural route is that which is commonly taken by the elephant-hunters, and which was followed by Mr. Baines on this occasion. It runs from Potchefstroom across the Magaliesberg, and nearly due north to the point where the Notuani River enters the Limpopo. By crossing the Marico and Notuani Rivers, the western, or outer side of the Limpopo is at once taken, and the great river in this way so outflanked that it has not to be crossed. The route then runs through Setcheli's and Matjen's country, until it reaches the Macloutzie River, a large affluent of the Limpopo, joining the main stream, where it bends off to the east, to make its great transverse bend, just without the 22nd parallel of latitude.

Immediately after the Macloutzie is crossed, the Makalaka country is entered; and here the route climbs directly to the main line of watershed which runs from south-west to north-east, and constitutes the high backbone that lies between the Limpopo and Zambesi. For nearly 200 miles it hugs the small streamlets that form the head-waters of the affluents of the Limpopo: that is, so far it keeps just on the Limpopo side of the central ridge; then it passes to the Zambesi side, and engages itself with the small streamlets that form the head-waters of the affluents of the Zambesi, and continues among them so far as this exploration was carried. This great ridge is very lofty in places; there are heights upon it that are more than 7000 feet above the sea-level. From the region of the tropics it runs, in a north-easterly course, to within the 19th parallel of south latitude, where it attains its most marked elevation; it then turns directly to the east, following the general course of the Limpopo and Zambesi, midway between them, until, at 150 miles from the coast of the Indian Ocean, where it looks down over Marico and Sofala, it fingers out exactly as the salient spur of the Drakenberg does in the colony of Natal, and gives rise to a series of secondary coast-rivers which enter the sea between the mouths of the Limpopo and Zambesi. From the commencement of the eastward bend, at the spot marked in Petermann's map as the Matoppo Berg (in all probability more correctly the Intaba Matoppo), another branch of the elevated ridge runs upwards to the north-west, extending in that direction, along the westward side of the Valley of the Zambesi, quite to the Mossamba Mountains, and to the spot where the Congo begins its westward flow to the Atlantic. This high land, extending from the neighbourhood of Marico upwards to the Mossamba Mountains, and downwards to the Kalahari Desert, and the mid-channel of the Orange River, and so determining the course of the Zambesi and Limpopo rivers, is

obviously the key to the physical geography of this southern segment of the great African continent, and therefore, on this ground, a feature of surpassing geographical interest. From the Tropic southward, the highest upheaving of the African land lies within 150 miles of the Indian Ocean, stretching through the Drakenberg, the Stormberg, and the Nieuveld Berg, almost to St. Helena Bay; giving the long course of the river-drainage almost from ocean to ocean, from east to west. But above the Tropic the case is exactly reversed; the summit-elevation of the line of watershed lies within 300 miles of the Atlantic, and the long course of the river-drainage, almost from ocean to ocean, lies from west to east. The course of the Zambesi extends in this direction more than 1200 geographical miles. Beyond, and within the 15th parallel of south latitude, from the region of Lake Nyassa, through the chain of Kilimandjaro and onward to the Abyssinian mountain-system, the rule of the eastern highlands again becomes established, as if in continuation and grander development of the Drakenberg; but the Zambesi cuts a mighty gap in the otherwise continuous eastern chain, and establishes the one great exception to the leading rule. This gap is made immediately to the north of the high tract which was the immediate object of Mr. Baines's exploration, and which is, therefore, an object of concentrated geographical interest.

On his way up the Matabele country, Mr. Baines paid a passing visit to Matjen, the chief of the Bamangwato tribe, at his chief kraal, called Shoshong. The general northward route was deviated from, in order to do this, by about 10 miles, the path leading westwards through a broad valley filled with ripe corn rippling in the breeze.

On leaving Shoshong, Mr. Baines's party moved on to the Macloutzie River, which was crossed on the 7th of June, and on the following day reached the Tati River. They found here several parties of diggers at work, for the most part in shafts between 40 and 50 feet deep, which had been formed through hard rock by boring and blasting. There were heaps of broken quartz piled round the mouths of the pits, and there were slight traces of gold in some of the quartz fragments; but the diggers were mainly aiming at reaching some deeper and richer lode. The latitude of the spot on which these miners were found at work is 21° 26′ 26″ S. The River Tati is the second feeder of the River Shashi, which flows into the northern stretch of the Limpopo near to Zoutpansberg.

After three days' sojourn among the miners at the Tati, Mr. Baines once more started towards the north, and, after five days' travel, reached the River Mangwe, where an Englishman, named Lee, resides, and acts as the accredited agent of the

Matabele tribe. On the following day he came to Manyama's place, which is the first outpost of the Matabele country.

Between the Macloutzie and the Mangwe Rivers the country is occupied by a tribe of people known as the Makalaka, who also extend along its affluents and down the Shashi River to its confluence with the Limpopo River on the Transvaal frontier. Allusion is frequently made in Mr. Baines's narrative to Kafirs of this tribe, but no mention is anywhere made of a supreme or very powerful chief. The Makalaka obviously stand in the position of entire subjection to their powerful neighbours on the north, the Matabele, who have been essentially an aggressive and warlike tribe during the rule of Umseligase; and, curiously enough, the Matabele seem to have derived this warlike spirit from the Zulu tribe, which has been the great focus of aggressive energy on the south-eastern coast of the African continent. An old Matabele told Mr. Baines of four well-known instances of independent warlike tribes formed by offshoots from the Zulus in the time of Chaka. Umseligase's case was one of these. He went off from the Zulus with a considerable following, and founded the Matabele tribe in the position it now occupies upon the high grounds between the Limpopo and Zambesi. The Amazetu, who are found towards Lake Nyassa, were spoken of as another instance. They took their name from Umsitu, a Zulu or Amaswase chief, who crossed the Zambesi in that direction.

On the 6th of July Mr. Baines started, with Mr. Lee and the two messengers, who were of the rank of indunas, or head-men, for Um-Numbata's place. The Mangwe River is the last affluent of the Limpopo which is passed upon this route.* They accordingly came, after traversing about 12 miles, upon the central line of the watershed which divides the Limpopo and Zambesi system of rivers. They halted on the exact crest, in a poort between hills formed of immense blocks of stone. The aneroid barometer at this spot was standing at 24·64 inches, and the boiling-point of water was at 204·1° Fahrenheit. Comparing the pressure of the air with the mean pressure at my observatory in Pietermaritzburg, Natal, derived from a series of eight years' observations, namely, 27·893 inches, this would give an approximate elevation for the pass of 2957 feet above my observatory, and 5052 feet above the sea-level. The ground was commonly crisp with frost during the night at this part of the journey, the period being the early part of the month of July. The greatest cold observed at night was 24·5°; more frequently the night temperature stood between 31° and 32°. The temperature of the day generally rose somewhere between 66° and 74°. The passage of the crest was made close to a

* This is incorrect, as the Shashani is crossed about 17 miles north-east of the Mangwe; it is the last affluent of the Limpopo.—[ED.]

large hill, which was spoken of as Matopola, and as Nogobhe's place. The latitude was fixed at 19° 42′ 49″ south. The pass is about 80 geographical miles, a little east of north, of the Tati River.

On the 8th of July, Mr. Baines reached the Kumalo River, the first distinct affluent of the Zambesi. The route now ran nearly parallel with the crest of the watershed, but just on the Zambesi slope, so that the head-waters of all the tributaries were passed in succession. On the 12th of July, Mr. Baines crossed the Flamba Baloi River, a name translated as meaning "the King's Bath." This stream is an affluent of the Gwai, or Tobacco River, the junction of which with the Zambesi Mr. Baines had visited in 1862. He reckoned that he was now, therefore, within about 130 miles of having completed the entire journey across Africa.

On the 14th of July the kraal of Umbigo was reached, a little short of the Im-Pombis River. From this a direct course through the Veldt to the east was taken, and the camp pitched on the Manpanjeni River, in lat. 19° 18′ 10″ s., within half a mile of Um-Numbata's kraal or town. Arrangements were then made, in due form, for the visit to the chief. The chief, in treating with Mr. Baines, only required that, before leaving the country, he should return and report to him what he had found.

On the 7th of August, Mr. Baines and Mr. Nelson resumed their journey with one waggon, and treked on northwards day after day, crossing in succession numerous affluents of the Zambesi, which are all duly named in the Appendix. The country passed consisted sometimes of stretches of sand, or of bare rock, enclosed by rounded hills of granite, with vast boulders and balanced logans; at other times, quartzose and schistose rocks appeared in naked ruggedness upon the surface. These wilder stretches alternated continually with gently undulating plains, often broken by successive ridges of quartzose rock, with shallow valleys lying between, sometimes gay with Proteas in full bloom, at other times covered with Bauhinias, Papilionaceous plants, 4 or 5 feet high (looking in this stage very much like regularly planted vines), and at others with scattered Mimosas. The granite ridges and hills were occasionally of whitish or grey bare rock, but in some places densely clothed with forest trees, interspersed with flowering aloes and Euphorbias, among which the Candelabra Spurge was of frequent occurrence. The gulleys were almost always verdant with Mimosas of different kinds, ranging from 16 to 20 feet high. The general range of the country traversed was found to be at an elevation somewhere between 3000 and 4000 feet.

Some of the rivers passed were exceedingly picturesque and beautiful, the water coursing freshly along over alternate rock and sand, the high banks being bordered by grassy knolls and clad with trees that overhung the stream, and the sides of the channel and quieter pools being covered with water-lilies. The Uzwezwe River, which was crossed on the 21st of August, was especially marked as being of this beautiful character.

On the 30th of August (in company with Mr. Hartley), they crossed the Inzinghazi River, and Mr. Baines encountered the Situs Buck, or sable antelope, for the first time, and soon after reached the Ganyana River. On the 1st of September, Mr. Baines started with a Mashuna chief, named Amakoonda, who took him through a group of hills over the Chingasora rivulet, another beautiful mountain-stream, and then through extensive corn-fields, and up a tortuous path to a kraal, or village, standing high among peaked and jagged rocks of grey conglomerate. On the 3rd of September they started due east from this kraal, and, in one hour's travelling on foot, with surface-indications of quartz continually increasing by the way, came into a district containing numerous old workings for gold. In one place there was a large bank or heap of quartz pebbles, with a great number of holes, from 3 to 4 feet in diameter, and from 5 to 10 feet deep. They returned by another route and another Mashuna kraal, and the next day visited a still more extensive group of workings on the Kanyamatimba River. From this, until the 17th of September, the time was occupied by both Mr. Baines and Mr. Nelson in examining and exploring the country in all directions. At the extreme point of his exploration Mr. Baines was in lat. 17° 35′ south, which very nearly corresponds with Karl Mauch's farthest advance in this direction in 1867. Mr. Baines has no doubt that, at this spot, he was within 50 miles of the Luenja, and other affluents of the Zambesi, in which the Portuguese wash alluvial deposits for gold. On September 21st, they recrossed the Sarua (or Sologozan), and on the 23rd again pitched their camp just beyond the Umfuli.

Mr. Baines and Mr. Nelson now spent some days in making a more careful examination of a group of old workings for gold which Mr. Hartley had pointed out to them on the Simbo River, between it and the Sarua, 2 or 3 miles to the north of the Umfuli River. This, on the whole, contained the most interesting specimen of the old native workings. The latitude of this spot was found to be 18° 10′ south, and the longitude about 30° 50′ east. The height above the sea-level was estimated at 3525 feet.

The workings, in this instance, were on a somewhat elevated hill, in two distinct ledges, or reefs, of quartz, 500 yards

asunder, which cropped out to the surface of the ground for a direct extent of between 400 and 500 yards. For this entire length the veins have been, more or less, broken up and worked, the best and richest specimens of the quartz having been removed, and the poorer specimens left behind as refuse. The refuse fragments have been thrown back upon the reefs as the work advanced along them, so that they are now entirely hidden by the débris. The fragments are scattered in heaps of various sizes, sometimes from 15 to 20 feet across. The deepest pit is probably not more than 8 feet deep; but all the pits have an accumulation of the broken fragments at the bottom, so that the exact depth cannot be ascertained unless the shafts are carefully cleared of the débris. It is perfectly manifest, from the appearance of the surrounding heaps, that the pits were dug deeper in some places, where the richest specimens of rock were found, than they were in others. Trees have grown in several of the pits, but the largest observed was not more than 5 inches in diameter.

Mr. Nelson felt confident, from all the facts which came under his notice, that these workings could not be more than from 150 to 200 years old. They were certainly made by the Mashuna Kafirs, a tribe which occupied the spot before Umseligase came and drove them further towards the Zambesi River, and towards the east. One old Mashuna told Mr. Baines that he could remember digging for gold having been carried on by his people on some of those very spots. All hunters and traders who have had intercourse with the Mashunas agree in describing them as a friendly, peaceable, industrious, and ingenious people. They make fine iron from the magnetic iron-ore, grow cotton, construct rude textile fabrics, and in many of these particulars are certainly in advance of the surrounding tribes. They have now, however, no certainty of life or property, because gangs of Matabele warriors continually sweep through their settlements, stealing cattle, sheep, and goats, and killing the people, or taking them away with them as captives. The development of the Mashunas has been effectually checked by the irruption upon them of the Matabele under Umseligase. It is certainly very wonderful that these Kafirs, so destitute of tools and mechanical aid, should have been able to extract gold from this adamantine rock. Mr. Nelson states that the work was effected by first breaking the quartz into small pieces, and picking out such scales of the bright metal as could be seen. The fragments were then placed in holes about 5 or 6 inches deep and broad, formed in granite or other hard rock, and round, hard boulders, of suitable size, were then rubbed round and round upon them; and the silica and lighter particles were afterwards

washed away from the gold, either in clay bowls or in cavities hollowed out in wood. How they contrived to break the quartz away from the solid hard reef, still remains the heart of the mystery. There is no doubt, however, that the want of effective tools always prevented them from penetrating into the quartz veins to any material depth.

Mr. Nelson, after mature consideration, came to the conclusion that this particular sett was the most promising that he had examined. It was therefore determined to endeavour to arrange with Um-Numbata for a grant of the right to crush for gold at this spot. Certain boundaries of ground were agreed upon, indicated in the north and east by the line of the river Simbo and by a chain of small hills, and in other directions by large ant-heaps with trees growing out of them, which were marked. The Matabele guide was then called, and these beacons and boundaries were pointed out to him as defining the ground which it was intended to ask from the chief. It was considered a very important point that there was an unlimited abundance both of wood and running water contained upon the actual ground.

The rock enclosing the quartz veins was found to be gneiss, and a mixture of talcose and chloritic slates striking about north-east and south-west, and dipping at an angle of from 70° to 80°. What stratified rocks could be examined throughout the entire district, were so hardened and metamorphosed that it was exceedingly difficult to arrive at any satisfactory conclusion regarding their geological age. Mr. Nelson, however, inclined to refer them to the Lower Palæozoic epoch. The quartz veins were so buried in the fragments produced by the workings that it was altogether impossible to ascertain their breadth below the surface of the ground; but this was certainly very considerable. Mr. Nelson found silver-bearing galena disseminated through the auriferous quartz; and this was the only spot in which this was the case in any of the extensive explorations made. Fragments of quartz rock were taken indiscriminately from the refuse of the workings at various places, and six of these have been since submitted to careful assay in England. Two specimens taken from one of the veins yielded at the rate of 0·825 and 1·950 ounces of gold per ton, Four specimens taken from the other vein yielded 0·975, 3·125, 3·500, and 8·150 ounces per ton. From one choice piece of quartz, belonging to this second vein, Mr. Nelson procured gold at the rate of 60·75 ounces, and silver at the rate of 17·1 ounces per ton. Under the circumstances in which this exploration had to be made, it was found to be quite impracticable to do more than take fragments of the rock lying ready to hand on

the surface; and it must be understood that these were all of the character of refuse which had been cast aside as valueless by the native workmen. There can be no doubt that the pieces selected by the Mashunas for the extraction of gold were of much richer character than the average range of these specimens, and that the substance of the quartz reefs, if they could have been got at, would have yielded rock of a similarly high value.

Through the entire extent of this high region, granite seems to form the backbone, or foundation, of the ridge of the watershed. It is, in many places, intersected with felspathic greenstone, and is associated with gneiss and hornblende schist in various forms of diversity, and with a hard rock, containing comminglings of talc and quartz. There is also connected with the escarpment of the granite a dark-coloured slate formation, about a mile across, in many places standing almost perpendicularly, and forming high bluffs on both sides of river channels. The slate band also forms regular high mountain ridges that can be seen for a long distance. It is this slate formation that is the principal seat of the quartz veins, which run in all directions, and are sometimes as much as 75 feet wide. Mr. Nelson remarks that it is here exactly as in California,—no gold is found along the main central line of the granite; the gold occurs where the stratified rocks trench upon the great granitic axis. This explains the presence of gold among the affluents of the Limpopo on one side, and among the affluents of the Zambesi on the other side, of the leading crest of the watershed. The river-courses are commonly paved with greenstone boulders, black iron sand, cornelians, agates, jasper, chalcedony, hornstone, and flint; and amidst these deposits there are often traces of alluvial gold. In most of the cases which came under notice the quantity was small; but Mr. Nelson was of opinion that it was very likely to be found in larger quantities in deeper parts of the river-bed. The River Changani seemed to him to be one of the most promising rivers for the extraction of gold from alluvial deposit by washing.

It is perhaps worthy of note that the gold-yielding districts of South Africa seem to be very much in the direction of a meridian of longitude. Small traces of gold have been found in Natal along the lower portion of the southern rivers, especially in the channels of the Umyinto and Umtwalume. Traces have also been seen in the Valley of the Tugela, near the junction of the Buffalo River. If a line be drawn directly north from the former of these positions, it passes through the latter; and this line, continued on still northwards, actually strikes the gold-bearing regions of the Simbo, those of the Tati being but a little farther towards the west.

About the beginning of April, after his return to the Transvaal, Mr. Baines found an opportunity, on the occasion of starting upon his first official visit to No-Bengule, after his installation as chief, to make his knowledge of the geography of the culminating point of the crest of the watershed more exact. The rivulet at Manyama's place is the first spruit of the Shashani River, and there are four more small rivulets between it and the main channel of the Shashani. There is then a rivulet running back, and down the valley by which the ascent to the crest is made; that is the first spruit of the Tati, which river it joins four days' waggon-journey below. At the top of the valley there are four miles with the head-waters of the Tati running, as spruits, backwards from the traveller's course, on his left-hand. A small rivulet is then reached on the left-hand, flowing in the opposite direction, and which is the first tributary of the Gwaii, belonging to the Zambesi system. The route then continues along the watershed, sometimes diverging a trifle to the south, so as to touch the sources of the Limpopo, feeding Tati, and sometimes trending to the north, so as to touch the sources of the Zambesi, feeding Gwaii. The actual watershed is very narrow, and at first runs nearly east, and then sweeps round to north-east and north, forming a mighty amphitheatre. A river running to the Limpopo rises a very few miles south of the In-Quenquis, a tributary of the Changani and Zambesi, on which the mission station of Inyati stands. The source of the Passorie, a tributary of the Limpopo, almost meets the source of the Changani; and these two rivers (the latter misspelled as the "Shungalla") form the boundary of the Transvaal given in the last proclamation of the President of that State. A little south-east of Um-Numbata's place rises the Doutac River, a principal branch of the Sabia. Ninety-four miles south-east of the Mashuna diggings, on the Simbo and Umfuli, is the kraal of the chief Inyorka, on the top of a range. Forty miles farther south-east is the kraal of Zebombom, also on a source of the Sabia; and 40 miles below this the river begins to be navigable, and canoes are used upon it. This places that particular spot of the northern gold-field within about 174 miles of a navigable river by the Sabia route. One hundred miles lower down, the chief Umzeila lives, on a large branch of the Sabia known as the Boozy. Umzeila is a son of the late chief Shishongaan, the notorious slave-trader of the country north of Delagoa Bay.

APPENDIX.—ROUTE OF THE SOUTH AFRICAN GOLD FIELDS EXPLORATION
Barometric Observations by

Date.	Place	Trocheameter. m.	far.	yds.	ft.	in.	Latitude. South. °	′	″	Nature of Observation.
1869										
May 12 ..	Potchefstroom, Coulson's Royal Hotel.			..			26	43	00	Stellar
* 12 P.M.	To Flat	28	3	109	0	7	26	23	0	D R
,, 13 ..	Foster's house at Wonder Fontein.	4	4	129	2	7	26	20	3	4 stars
,, 14 ..	Flat	12	2	8	0	11	26	10	30	..
,, 14 P.M.	Hol Fontein	0	4	53	1	2½	26	10	10	3 stars
,, 15 ..	Blaawe Bank	10	0	102	2	1	26	2	10	D R
,, 15 P.M.	Entrance of poort	4	4	114	0	10½	25	59	10	..
,, 17 ..	Foot of Magaliesberg	7	3	152	0	6	25	54	20	..
,, 17 P.M.	Shore of Van Staadens	6	7	49	0	4½	25	51	50	..
,, 18 ..	Over Olifant's Nek	8	0	63	0	3	25	46	0	..
,, 18 P.M.	1 mile south-east of Rustenburg.	6	5	159	0	9	25	41	28	3 stars
,, 19 ..	Past Maiden's Kraal	14	4	40	0	5½	25	30	11	1 star
,, 20 ..	South end of Pilan's berg ..	11	2	161	0	10½	25	21	20	..
,, 20 P.M.	North-east of Saul's poort ..	14	4	34	2	9	25	11	10	..
,, 21 ..	Brak Water Spruit	8	4	152	2	3½	25	6	40	..
,, 21 P.M.	Beer Kraal	10	0	0	0	0	25	2	48?	D R
						or	24	49	0	
,, 22 ..	Hol Fontein	11	3	0	0	4	24	49	50	..
,, 22 P.M.	Mimosa Grove	6	0	196	0	11	24	44	50	..
,, 22 Evg.	Grassy Plain, no water ..	9	43	19	0	9	24	37	17	2 stars
,, 23 ..	Klip Kuil, little water	1	7	34	1	2½	24	35	30	..
,, 23 P.M.	Limpopo or Krokodil River ..	14	2	127	1	0	24	23	0	D R
,, 24 ..	Ditto ditto	10	1	170	2	0½	24	17	0	..
,, 24 P.M.	Cross Marico River at its junction with Limpopo.	9	2	31	0	7	24	10	58	3 stars
,, 25 ..	Limpopo River	7	5	88	2	6½	24	0	50	..
,, 25 ..	Ditto	4	0	52	3	0	24	1	0	..
,, 25 P.M.	Ditto	8	2	36	2	2½	23	55	20	3 stars
,, 26 ..	Krantz draai, Limpopo	10	5	60	1	7	23	49	0	D R
,, 26 P.M.	Cross Notuani River, Limpopo	6	5	32	0	2½	23	44	31	2 stars
	Carried forward	248	3	200	2	10½				

* The latitude of Macabe's farm, taken by myself in 1850, is 26° 30′ 30″.

COMPANY'S EXPEDITION. Observed by T. BAINES, Commanding. Calculations and R. J. JEWELL, Secretary.

Longitude. East.	Nature of Observation.	Boiling Point.	Barometer.	Thermometer.	Maximum.	Minimum.	Height in Feet.	REMARKS.
° ′ ″								
27 33 40	Lunar by E. Mohr	204·6	24·85	65½	..	..	3900	Lat. obs. by E. Mohr 26° 42′ 54″. Long. obs., by E. Mohr 27° 33′ 40″ observed in circus behind the Royal Hotel, Coulson's.
27 44 30	D R							
27 47 0	D R	..	..	..	..	32		Mr. Mohr's lat. is 26° 20′. Wonder Fontein 1 mile E.N.E.; house, 500 yards south-east.
27 52 0	..	..	..	75	80			
27 52 10	..	202·9	24·70	55	..	38	4810	The Fontein, south-west 100 yards; the house, south-east 500 yards. Meet Glasgow party.
27 52 0	..	..	..	..	..	..	..	North of river, house on left. Ride E.N.E. about 6 miles to Mr. Hartley's at Thorndale.
27 49 40								
27 48 30	..	..	..	60	68	..	..	
27 42 20	..	204·8	25·	46	..	39	3792	
27 38 10	..	..	..	75	..	..	..	Cross Hex River before crossing the Nek.
27 39 30	..	205·6	25·25	38	..	35	3367	The Dorpspruit runs into Hex River.
27 40 50								
27 39 0	..	206·3	25·65	54	64	..	3047	
27 29 30	..	..	..	..	..	41	..	Pass a village of Kaamayans.
27 23 0	..	..	..	..	31	..	..	North end of Pilan's berg.
27 18 30	..	..	..	..	..	..	..	South of the heights of Kurichaine or Water berg.
27 14 20	..	..	..	..	81	..	..	North of the heights.
27 13 50	..	205·2	25·50	71	81	..	3580	
27 10 40	..	..	..	..	..	50	..	Lion round the cattle.
27 9 40	..	206·3	25·50	61	..	50	3520	
27 7 10	..	206·7	26·50	65	95	..	2782	¾ mile west of river.
27 0 0	..	..	..	..	..	45	..	Outspan under Haak
26 54 0	..	206·9	26·50	64	79	..	2676	Down on west bank of river.
26 50 0	..	..	..	..	..	50	..	Pass large Wellegaat
26 49 30	..	..	..	..	90			Bourn. Outspan under large tree.
26 34 30	..	..	..	..	93			
26 40 40	..	207·4	26·40	73	..	48	2412	
26 43 10	..	207·7	..	..	..	..	2253	Beside the Limpopo. Concert of lions.

APPENDIX—

Date.	Place.	Trocheameter. m.	fur.	yds.	ft	in.	Latitude. South. °	′	″	Nature of Observation.
1869	Brought forward	248	3	200	2	10½				
May 27 ..	Suruma Vlei	14	7	113	2	0½	23	36	30	D R
,, 27 P.M.	Surimane River, dry	8	1	30	1	11	23	33	0	3 stars
,, 28 ..	Klip Kuil or stony pool ..	8	3	78	1	6½	23	26	10	D R
,, 28 P.M.	South of the Kopjie	9	6	123	2	5	23	19	12	3 stars
,, 29 ..	Plain with Mimosas	6	5	143	1	7½	23	14	10	..
,, 29 P.M.	Ba-Mangwato hills	10	4	1	1	7½	23	6	54	3 stars
,, 31 ..	From Ba-Mangwato hills to round the point of hill.	7	6	209	2	7	23	3	0	D R
June 1 ..	South-west of Mahalapi River	7	7	110	0	10	22	57	30	..
,, 1 P.M.	Cross Mahalapi and Meetli rivers and outspan on flat.	8	1	0	0	6	22	53	2	2 stars
,, 2 ..	Cross Touani (Little Lion) River.	4	0	136	2	4	22	51	10	D R
,, 2 P.M.	Chakani Pans	10	4	42	2	10½	22	44	10	..
,, 2 P.M.	On flat. Pass Limonie ..	7	5	73	1	4½	22	39	50	..
,, 3 ..	Lotsani River	10	3	196	2	1	22	35	40	..
,, 3 ..	Krantz Kopjie and pool ..	4	2	136	1	9	22	34	0	..
,, 3 P.M.	Pass Palatzie—on flat	9	6	155	0	8	22	29	0	2 stars
,, 4 ..	Sandy hollow	7	7	156	1	3	22	26	30	D R
,, 4 ..	Cross Seruli River	9	1	50	2	9	22	20	47	☌
,, 4 P.M.	Pass Pan—outspan on flat ..	7	3	195	1	2⅓	22	15	50	3 stars
,, 5 ..	Flat, no water	6	5	67	0	8⅓	22	10	10	..
,, 5 P.M.	Cross Gōkwē River	9	4	118	2	2½	22	2	49	4 stars
,, 7 ..	Past Kachani River, outspan on flat.	10	2	151	2	8½	21	54	40	D R
,, 7 P.M.	Cross Macloutsie River	8	5	59	1	3	21	48	25	4 stars
,, 8 ..	Cross Big Sand Spruit, large Haak Dooru tree on north-east side.	6	5	80	2	1½	21	43	0	D R
,, 8 P.M.	Shashi River, north-east side	12	2	114	2	10½	21	33	13	2 stars
,, 9 ..	Cross Tati River, outspan on bank	6	6	33	1	6	21	27	0	☌ T. Baines
							21	28	0	☌ E. Mohr
.. 11 ..	On flat, near small Spruit ..	8	3	199	2	11	21	21	0	D R
,, 11 P.M.	Ramakoban, south-west of river	10	4	6	2	4	21	13	0	..
,, 12 ..	Cross Um̄-pakwe	9	5	166	0	9	21	5	59	3 stars
	Carried forward	492	1	77	2	7½				

ntinued.

Longitude. East.	Nature of Observation.	Boiling Point.	Barometer.	Thermometer.	Maximum.	Minimum.	Height in Feet.	Remarks.
° ′ ″								
26 44 20	..	..	..	76	..	..	..	Leave Limpopo where Matclabats runs in.
26 41 10	..	207·2	26·35	56	..	..	2518	Swarms of locusts, full of eggs.
26 37 30	..	207·0	..	..	..	40	2623	Meet division of Glasgow
26 34 0	..	206·9	26·20	47½	..	..	2676	party returning.
26 32 0	..	..	..	..	..	33		
26 31 10	..	..	..	..	..	..	..	Shoshong 10 miles W.N.W
26 36 0	D R							
26 40 30	..	..	..	..	..	34		
26 45 10	..	..	..	..	..	38	..	No water. One of Mr. Hartley's horses died
26 48 20	..	..	..	..	..	65		of the sickness.
26 56 0	..	206·0	25·20	62	..	..	3154	No water.
27 1 10	..	..	..	..	..	..	..	Travel till 10.20 P.M. No water.
27 8 20	..	206·9	26·6	..	..	..	2676	Inspan at 2.35 A.M. Found a little water in Lotra down hill; first mopane trees.
27 12 20	..	206·8	26·65	82½	..	..	2729	Heavy sand.
27 20 10	..	..	..	..	..	..	..	Pass a Fly Kopjie south
27 26 10	..	206·7	25·95	43½	..	39	2782	of our road.
27 32 0	..	206·6	26·63	77	..	..	2835	Meet McNeil's party. Four deaths, two cases of fever.
27 34 0	..	206·6	26·00	41	..	..	2835	No water.
27 35 10	..	206·8	26·50	..	..	39	2729	
27 37 30	..	207·1	26·37	70	..	..	2591	
27 42 30	..	207·2	26·85	59	..	37	..	One hour and 50 minutes past Kachani River at 2½ miles per hour.
27 45 30	..	..	..	..	..	..	..	This river is the north-east frontier of Matjen's province.
27 47 0	..	207·2	26·85	62 53 at 2 A.M.	..	..	2518	The minimum cannot be observed when the waggon is in motion before sunrise.
27 49 10	..	206·8	26·22	62	90	43	2729	A large tributary of the Limpopo receives the
27 51 0	Lunar E. Mohr	207·0	26·22	45	1	44	2623	Tati, and several other
27 52 0	D R	207·0	26·33	59	..	44	2623	rivers below the houses of the gold-diggers.
27 56 30	..	206·8	26·10	86	..	..	2729	Broad sandy river.
27 58 30	..	206·7	26·00	69	77	31½	2788	Ruins of Mashuna Kraal, rough walls of dry stone.

APPENDIX—

Date.	Place	Trocheameter. m.	fur.	yds.	ft.	in.	Latitude. South. ° ′ ″	Nature of Observation.
1869	Brought forward	492	1	77	2	7½		
June 14 ..	Cross Un-Kwezi River at Makhōbē's.	10	6	166	1	4	20 57 9	3 stars
,, 15 ..	Cross Sawpit spruit of Mangwe River.	20	0	15	2	8	20 44 40	E. Mohr and T. Baines
,, 16 ..	Cross Semokhie River	6	4	86	0	3	20 39 30	D R
,, 16 P.M.	Manyama's on a small spruit of Shashani River, granite hills.	4	3	182	0	11	20 37 10	3 stars
	From Ba-Mangwato hills to Manyami's.	227	0	54	2	9		
	From Potchefstroom to Ba-Mangwato hills.	307	0	33	2	0½		
	Total	534	0	88	1	9½		
July 6 ..	From Manyama's			..			20 37 10	Many various stars
	Crossing the Shashani River to top of the hill Malapola or Naghōbē's.	11	6	109	0	8	20 30 2	1 star
,, 7 ..	To grassy slope	7	1	211	0	10	20 26 30	..
,, 7 P.M.	Um-Vonulu's—Inthaba Indhlana.	3	1	205	1	3	20 23 47	3 stars
,, 8 ..	Zeslashin Zangwe or tiger bush.	5	0	207	1	2	20 21 30	..
,, 8 P.M.	Cross Kumalo or Royal River	6	0	153	1	4	20 16 38	2 stars
,, 11 ..	Dry Spruit	11	3	16	2	1½	20 7 23	2 stars
,, 12 ..	Flamba Boloi (Bath of Majesty), Umkhosi or King River, south-west side	6	1	81	0	1½	20 4 20	..
,, 12 P.M.	Flat, where lion attacked us ..	7	4	104	2	10½	19 58 52	3 stars
,, 13 ..	To Umgnoma, Wild Olive-wood River, south-west side	4	4	0	0	0	19 56 0	..
,, 14 ..	Past Um-Haegua's village ..	7	3	65	0	11½	19 51 30	..
,, 14 P.M.	Cross a spruit south-west of Bembesi River, turn east here leaving the road going north-east on our left.	7	6	169	1	2	19 46 45	2 stars
		78	3	4	0	6		
,, 15 ..	Umlomo's Kraal	6	4	129	1	4½	19 44 30	..
,, 15 P.M.	Bleak flat, no water	3	5	53	0	8½	sky clouded 19 43 30	.. D R
	Carried forward	10	1	182	2	1		

ntinued.

Longitude. East.	Nature of Observation.	Boiling Point.	Barometer.	Thermometer.	Maximum.	Minimum.	Height in Feet.	Remarks.
° ′ ″								
28 1 20	..	205·8	25·70	53	..	..	3260	Granite kopjies.
28 13 48	Lunar E. Mohr	205·4	25·20	47	..	..	3470	Lee's farm on the Mangwe ½ mile north-east, winding round through granite hills.
28 16 20	D R							
28 19 0	..	205·4	24·80	74	..	..	3470	Outpost of the Matabele, where travellers send forward for leave to enter the country.
2 18 0	D R							
8 26 40	..	203·8	24·47	69	..	..	4328	
3 31 50	..	203·7	24·45	90	..	..	4381	
3 34 0	..	204·0	24·53	77	..	30½	4221	A granite hill.
3 37 0	..	203·9	24·35	85	..	..	4274	
3 41 0	..	204·2	24·63	78	..	..	4114	Source of the river Gwaii. First water flowing to Zambesi.
3 44 30	..	204·4	24·75	34	..	..	4007	
3 49 20	..	204·7	25·00	53	72	24½	3846	
3 54 10	..	204·4	24·95	58	77	..	4007	No water. Horses strayed. Next morning, Matabele found and brought them back.
3 57 0	..	204·8	25·00	50	69½	45	..	
4 3 0	..	204·6	24·70	73	..	..	3900	At a scanty rill in valley beyond the village.
4 8 30	..	204·7	24·90	49	..	..	3846	Zong in Thaba Kraai, under Umbigo, 10 miles from the mission station at Inyati.
12 30								
16 0	..	..	..	..	67	44		

APPENDIX—

Date.	Place.	Trocheameter. m.	fur.	yds.	ft.	in.	Latitude. South. °	′	″	Nature of Observation.
1869	Brought forward	10	1	182	2	1				
July 16 ..	In-Quenquis River	3	1	95	1	4½	19	43	0	Sky clouded
,, 17 ..	Strike the road from the mission to Manpanjeni, and outspan at dry spruit.	6	1	138	1	10	19	43	0	..
,, 17 P.M.	Cross Sangwe River and pass Iing-en's Kraal.	8	5	57	1	3½	19	42	40	..
,, 18 ..	Inyanga or Doctor's Kraal, ½ a mile short of the village	9	3	131	0	7	19	40	20	1 star
,, 19 ..	Manpanjeni or Umbanjin ..	5	3	125	0	1½	19	42	30	6 stars
Aug. 16 ..	From Manpanjeni, turn (due) N.N.W. without a road, cross spruit of Mnyami and Changani rivers, and outspan in grove of thorn and kookootoo-tree.	6	5	211	1	10	19	36	0	1 star
,, 7 ..	Cross small spruit	7	3	195	1	2½	19	30	30	..
,, 7 P.M.	Ditto	2	0	165	0	8	19	29	0	1 star
,, 9 ..	Ditto	8	6	133	0	4½	19	23	43	☌
,, 9 P.M.	In twenty minutes strike the main road from Inyati going north-east. Cross Umbanga River and a sandy spruit, and in two hours from striking the road, outspan.	4	7	9	1	6½	19	20	25	1 star
		73	1	125	0	11				
,, 10 ..	From sandy spruit east of Umbanga River, granite hills on south.			..			19	20	25	1 star
				..			19	18	50	Um Vungu
	In one hour cross the U-vungu River and outspan two hours and twenty minutes beyond on a sand belt in Mopani forest.	7	1	173	2	10½	19	16	10	D R
,, 10 P.M.	Cross U-Gwelo River	8	4	31	1	0	19	11	15	1 star
,, 11 ..	Cross Ūn Gwenya (Crocodile) River.	3	2	157	0	7½	19	19	30	..
,, 11 P.M.	Wooded sand belt, no water	7	5	104	2	7	19	4	20	Clouded
,, 12 ..	Cross Inkokwaasi Rivulet ..	3	4	118	2	11½	19	2	0	..
,, 12 P.M.	Cross Inchamba Rivulet and outspan at old kraal.	15	2	126	1	5½	29	6	21	☌ on 13th
	Carried forward	45	5	52	2	6				

continued.

Longitude. East.	Nature of Observation.	Boiling Point.	Barometer.	Thermometer.	Maximum.	Minimum.	Height in Feet.	Remarks.
° ′ ″								
29 19 0	..	204·7	26·97	52	60	..	3846	Stick fast and unload. This is the river In-Quenquis; the mission station is 5 or 6 miles lower down.
29 24 0	..	..	..	..	..	46	..	
29 31 30	..	204·7	..	56	60	..	3846	Four small rivers near this.
29 39 40	..	204·7	24·90	49	..	44	3846	Medical attendant to the royal family.
29 44 30	..	204·6	24·80	50	69	40	3900	Village of Um'Numbata Regent of Matabili land.
29 44 55	..	204·7	25·57	76	..	..	3846	Inyati bears 280 (mag) about 35 miles.
29 43 30	..	204·6	25·20	60	..	39	3900	
29 42 30	..	204·6	25·20	70	71	43	3900	South of Intaba-Mad wala, said to be ruine Portuguese houses a bout here.
29 38 0	..	204·6	25·20	70	..	43	3900	Inthaba Banga N.N.E (due).
29 40 0	..	204·7	25·25	57	75	..	3845	Meet Mr. S. Edwards bound to Inyati.
29 40 0	D R							
29 42 0								
29 45 0	..	204·4½	25·10	68	..	41	3980	The Uvungu Rive has steep banks an sandy bed, 75 or 10 yards wide.
29 50 10	..	204·8	25·25	48½	89	..	3793	Sandy bed, fine pool above the drift.
29 52 20	..	..	..	..	..	29	..	Small river. Meet Han' Haai, a Griqua hunter
29 57 00	..	204·4	25·10	..	..	..	4007	Ughondie and other soft wood trees.
29 58 40	..	204·7	25·15	72	..	55	3846	In a road too far to th north.
30 9 10	..	204·8	25·22	77½	..	..	3793	Course to the south-east Nelson sees two lions.

APPENDIX—

Date.	Place.	Trocheameter. m.	fur.	yds.	ft.	in.	Latitude. South. °	′	″	Nature of Observation.
1869	Brought forward	45	5	52	2	6				
Aug. 13 P.M.	Cross U-Quaequae River ..	3	4	205	0	6	19	7	25	Cloudy, 4 stars, 1870
,, 14 ..	Matchabella Grove, no water.	9	7	45	2	0	19	1	40	..
,, 14 P.M.	Cross Im Bembis or Bembesi River.	4	6	77	2	1	18	58	30	1869 and 1870
,, 16 ..	Cross Sebaque River (first palms).	5	5	156	1	10½	18	55	7	5 May, 1870
,, 17 ..	Small river (Indhlovu or Elephant).	7	7	10	2	10	18	51	40	..
,, 17 P.M.	Small river, nameless	4	4	77	2	2	18	49	48	1 star
,, 18 ..	Cross Umyati River, broad sandy bed and steep banks.	8	2	90	0	1½	18	45	18	1 star
,, 19 ..	Cross Ungezi River, rapid stream, rocky drift.	5	1	2	2	6	18	42	0	D R
,, 19 P.M.	5½ furlongs short of Ungezan or Inkwazan or Little Ungezi.	3	7	13	1	2	18	39	0	..
,, 20 ..	Cross Ungezan and several little rivers, among which is the "Break-down" rivulet of 1870, and outspan at a			..			18	33	36	3 stars
	Rivulet in grassy valley ..	12	5	190	2	6	18	29	56	1 star
,, 21 ..	Cross Uzwezwe River	2	3	50	2	1	18	29	7	South side, 3 stars, 1870
,, 21 P.M.	Cross mud spruit and outspan in soft-wood grove, 1¼ mile beyond.	9	4	3	1	7½	18	22	16	2 stars
,, 24 to 27	About 6 miles to the north the road turns more easterly, then north again, crosses the Zinlundasi Rivulet and the Umfuli River at Hartley drift, then turns north-west to the Sarua.			..			18 18	18 14	00 30	.. ..
,, 27 P.M.	Cross Sarua River	27	1	194	0	10	18	7	40	..
,, 28 ..	Cross half-a-dozen small rivulets and	14	0	39	1	5½	17	58	11	1 star
,, 29 ..	Cross Imbeela (or Rock Rabbit) River.									
	Carried forward	165	2	111	2	3				

continued.

Longitude. East.	Nature of Observation.	Boiling Point.	Barometer.	Thermometer.	Maximum.	Minimum.	Height in Feet.	Remarks.
° ′ ″								
30 11 20	..	204·8	25·22	60	..	..	3792	Join Hartley's Road just before crossing the river. Fine broad running stream.
30 18 0	..	..	..	..	..	..	..	Halt for flesh of wildebeeste.
30 20 0	..	205·4	25·25	63½	..	..	3474	Water 2 ft. 6 in. deep at the drift; broad low valley on each side.
30 24 0	..	205·5	..	50	..	42	3420	Buffaloes and lions plentiful. Tsetse not far down the river.
30 29 30	..	205·5	25·60	60	..	..	3420	
30 33 40	..	205·5	25·26	50	65	..	3420	Fine pool below the drift.
30 36 0	..	205·6	25·64	54½	..	40	3366	Rugged granite hills going into the trap makes a needless half mile.
30 39 0	..	205·4	25·55	57½	..	..	3475	30 yards broad water, cool and clear, running into Umyati 2 miles below the road.
30 41 0	..	..	..	62	..	..	..	Runs into Ungezi nearly 2 miles below the road.
34 44 20								
30 46 0	..	205·2	25·40	49	68	36	3580	On foot from Jennings'.
30 47 0								Overtake Nelson here.
30 48 0	..	204·8	25·22	64	..	69	3793	In returning, we took a more direct route nearly south from the Sarua, reducing the distance considerably, as will be seen further on.
30 55 00								
30 55 30								
30 48 30	..	205·3	25·45	70	82	50	3526	Called Sulagozan River, to commemorate the killing of an old woman; also Mopanie River. Strong stream.
30 40 0	..	205·2	25·40	77½	82	42	3580	Rocky river, joins Umfuli 25 miles down.

APPENDIX—

Date.	Place.	Trocheameter. m.	fur.	yds.	ft.	in.	Latitude. South. ° ′ ″	Nature of Observation.
1869	Brought forward	165	2	111	2	3		
Aug. 30 ..	Cross Inzinghazi River	7	5	162	1	5½	7 50 36	1 star
,, 31 ..	Ganyana River, Panjamey of Livingstone, where it joins the Zambesi.	9	7	8	1	5	17 44 56	2 stars
		182	7	62	2	1½		
	Amakoonda's Village ..			..			17 33 0	DR
	Old Diggings			..			17 31 40	..
	Return Journey from Sarua River north side.			..			18 27 40	DR
Sept. 21 ..	Across Simbo Rivulet to Hartley Hill, the Company's first claim.	5	4	141	2	11½	18 11 39	3 stars
,, 22 ..	North side of Umfuli, opposite Sir John Swinburne's digging.	0	7	87	1	3	18 12 30	DR
,, 23 ..	Cross Umfuli River below junction of Zenlundasi River	3	6	95	0	1½	18 14 0 18 12 16	DR 1 star
Oct. 2 A.M.	Junction of new road with the old.	5	6	142	0	2	18 19 10	DR
,, 2 P.M.	Small stream in open valley	4	0	42	1	6½	18 21 37	3 stars
	Our outspan of August, 21 and 23.	1	2	25	1	0½	18 22 16	1 star 2 sun
	Total by direct road ..	21	3	94	1	1		
	From outspan of August 21 and 23, to north side of Sarua by old road	27	1	194	0	10		
	Difference in favour of new road.	5	6	99	2	9		
,, 4 ..	Outspan of August 21 to Uzwezwe, north side.	7	3	200	1	11	18 29 7	South side, 3 stars

continued.

Longitude. East.	Nature of Observation.	Boiling Point.	Barometer.	Thermometer.	Maximum.	Minimum.	Height in Feet.	Remarks.
° ′ ″								
30 39 50	..	204·7	25·22	60	..	..	3846	Runs into Imbeela.
30 41 20	..	204·5	25·2	77	80 95	52	3953	From this camp I rode about 35 miles north-west by west (due) to Amakoonda's, a Mashuna chief, and saw old diggings; there is Tsetse about 10 miles beyond.
30 17 20								
30 19 0								
30 48 20	D R							
30 49 20	..	204·8	24·70	..	95	..	3798	The new road crosses nearly south from Sarua to Simbo River, the old one goes east from 4 to 6 miles. The holes were dug by Sir John without permission from the Matabele.
30 49 10	..	..	..	..	95			
30 51 40	..	205·	24·92	74	98	42	3686	Kigeliso pinnata, or pas pisa trees, north of the drift.
30 50 40	..	..	..	..	82	48	..	My last ride on "Dutchman" in chase of rhinoceros.
30 48 50	..	..	..	..	94			
30 48 0	..	..	..	..	..	..	..	One ox died here in coming in, and my horse "Dutchman" died 1¼ mile south in the return journey. Matabele army, returning from plundering the Mashunas, overtakes us
30 47 0	..	..	..	78 at 7 P.M.	91	62	..	Saving of 2 m. 22 y. 2 ft 8½ in. by not turning out to the eastward Moderate shower.

APPENDIX—

Date.	Place.	Trocheameter. m.	fur.	yds.	ft.	in.	Latitude. South. °	′	″	Nature of Observation.
1869										
Oct. 8 ..	From north of Umyati to outspan of August 17, by rivulet.	7	6	183	2	0½	..			..
,, 15 ..	From U-Quaequae east side by road nearly due west.			..			19	7	25	..
	Cross the Inchamba, to Lunda Route.	10	2	50	1	11	19	10	55	..
,, 15 P.M.	Past Un-Gwenya River, no water.	12	0	185	1	9½	19	11	30	..
,, 16 ..	Cross U-Gwelo River to west side.	2	6	142	2	0½	19	11	15	1 star
	Total by direct road ..	25	1	158	2	9				
	From U-Gwelo 200 yards on east side by northern road to across U-Quaequae.	33	4	52	1	1½	..			..
	Difference in favour of direct route.	8	2	113	1	4½				
,, 19 ..	From west of Umbanga River, where we met Mr. S. Edwards, August 9th, to			..			19	22	30	..
	cross Changane River, broad sandy.	9	4	50	2	0	19	27	40	..
,, 19 P.M.	Cross I-zango River, broad sandy.	2	4	66	1	4½	19	29	0	..
,, 20 A.M.	Cross small rivulet	3	2	186	1	0	19	30	40	..
	Cross Ohlungo Route, cross Umcloutchan and another route.	6	4	154	0	3½	19	34	0	..
,, 20 P.M.	Cross Inzolongo River ..	2	6	71	1	5	19	35	30	..
	Between the hills, Piccaroon Kraal.	4	1	215	0	8	19	37	30	..
,, 21 A.M.	Inyati Mission Station	6	6	203	0	10½	19	40	48	E. Mohr
Nov. 6 ..	Cross In-quenquis River ..	1	1	119	2	0½	19	41	30	..
,, 8 ..	Cross Imbusini Rivulet	3	5	195	1	9½	19	43	10	..
,, 9 ..	Cross Bembesi River to our outspan of July 14.	4	7	124	2	1½	19	47	0	..
	Total by direct road ..	45	6	67	1	7				
	From outspan of July 14 Bembesi by Manpanjeni to Umbanga River.	73	1	125	0	11				
	Difference in favour of direct Route.	27	3	57	2	4				

continued.

Longitude. East.	Nature of Observation.	Boiling Point.	Barometer.	Thermometer.	Maximum.	Minimum.	Height in Feet.	Remarks.
° ′ ″								
..	..	..	..	..	98	60	..	Saving of 1 m. 1 f. 137 y. 2 ft. 1 in. by not going into the trap. This distance may still be shortened by taking the straight road.
30 11 20								
30 3 30	..	204·3	24·55	83	89	54	4060	
29 53 40	..	204·6	24·60	72	..	..	3900	B. P. 200 yards on east of U-Gwelo August 10.
		204·8	25·25	48				
29 50 10	..	205·0	24·90	71	95	53	3686	
..	..	..	..	..	..	..	..	Less by about 300 yards, on account of difference in outspan place.
29 38 40								
29 31 40	..	..	..	..	93	68		
29 30 0	..	..	..	..	100			
29 28 10	..	..	..	..	..	55	..	Meet Watson with 8 o
29 23 30	..	..	..	59				our oxen from Inyati to assist us.
29 21 40	..	..	..	86	95			
29 19 0	..	..	..	61	..	..	..	Very dry. No grass fo oxen.
29 13 30	E. Mohr, lunar	204·2	24·62	84	..	..	4115	The west corner of th Rev. T. M. Thomas' house, bearing 330 ½ ; mile.
29 13 0	..	204·2	24·65	82	94	63	4115	Heavy rains. Rainfal at Inyati 0·47 inch.
29 11 0	..	204·6	24·77	71	..	..	3900	Near Umnyakangya'
29 8 20	..	..	..	..	83	63		village.

APPENDIX—

Date.	Place.	Trocheameter. m.	fur.	yds.	ft.	in.	Latitude. South. °	′	″	Nature of Observation.
1870				..						
Apr. 8 ..	From Kumalo, north side, turn						20	16	38	2 stars
	south of the main road, Kaami Route, cross to south of watershed, pass Um-thlatlan-laylor on our left.	3	4	15	2	0	20	19	0	D R
,, 8 P.M.	Cross River Umthenyani.	5	5	214	0	2	20	19	30	D R
,, 8 P.M.	Gibbeklaike the King Lo-Bengulu's new town.	3	3	167	2	3	20	18	11	3 stars
,, 18 ..	Down the south-east face of the mountain, crossing the Inzingwaine, to make a new kraal for the King, circuitous route.	* 11	3	54	1	11	20	22	46	5 stars
,, 26 ..	From Gibbeklaike to abreast of the old village of Lo-Bengulu, on our left.	3	1	125	0	2	20	16	0	D R
	To rivulet going to Flamba Boloi River or Umkhosi.	1	2	153	1	9	20	15	30	D R
,, 26 ..	Stick-fast Rivulet	1	0	198	0	11	20	14	40	..
,, 27 ..	Pass Umzinyati village on the Umkhosi or King River, on which is Slambo Boloi.	5	By estimation				20	11	0	..
,, 27 P.M.	Cross Zizibantu River, pass Inthaba Induna on our left, and cross rivulet.	8	6	152	0	4	20	5	18	2 stars
							20	6	0	..
,, 28 ..	Cross Coeghla Rivulet and pass north of Inzingwaine Hill, ½ mile.	4	7	141	2	10	20	1	0	..
,, 28 P.M.	Pass Ehbaine's, on rivulet running to Um-Bembesi.	6	2	125	2	6	19	55	30	..
	South of the Zong in Thaba hills.	4	5	171	1	9	19	51	40	..
,, 29 ..	Cross Bembesi south of Zong in Thaba hills.	5	1	179	2	6	19	47	20	..
,, 29 P.M.	Cross In Quenquis and reach Inyati, the London Mission Society's Station.	7	6	197	2	10	19	40	48	E. Mohr. Crucial Station.
	Total Kumalo to Inyati by Gibbeklaike.	61	2	30	2	0	..			..
May 9 ..	From Inyati, eastward, to the south of the main road.									
	To flat. Sokhele's Kraal, north-west 1 mile.	6	3	76	2	7	19	41	38	4 stars
	Carried forward	6	3	76	2	7				

* To be omitted in adding up.—[T. BAINES.]

continued.

Longitude. East.	Nature of Observation.	Boiling Point.	Barometer.	Thermometer.	Maximum.	Minimum.	Height in Feet.	Remarks.
° ′ ″								
28 41 0	Dead reckoning							
28 46 0		204·	80·	75	..	..	4221	The country is tolerably well wooded from Kaami up to this. The heights of the water-shed become gradually more bare.
28 47 30	D R	Position of town of Um-thlat-lan-laylor nearly the same as Kaami route. Boiling-point about the same.						
28 52 0	D R	..	..	..	..	..	..	At Gibbeklaike the cattle were lung-sick. I sent ours to stay near Kumalo.
28 57 0	D R	..	..	..	..	..	..	The footpath is about 8 miles. Difference of latitude 0° 4′ 35″.
28 51 0	D R	..	..	..	..	..	..	The old village of Bangulu is as far on the north side of the water-shed as Gibbeklaike is south.
28 51 40								
28 52 10	..	..	..	..	..	..	..	Heavy rains and black adhesive mud.
28 54 30	Village ½ mile west.	..	..	..	..	..	..	Inthaba Induna (hill of chief). Several chiefs were killed here for electing a king, while Umselegas was away at Zambesi.
28 59 0	D R							
28 57 0	..	Position of the Inthaba Induna approximate.						
29 1 0	..	..	..	..	..	..	..	Umnombuti declares Kuruman was killed here. Lo-Benzulu was saved by a man who hid him in the shield-house by order of Umselegas. The Zong in Thaba rebel regiment is now annihilated.
29 6 30								
29 8 20								
29 10 30								
29 13 30	E. Mohr	.. 204·2	.. ..	.. ..	.. ..	.. ..	.. 4115	Very heavy rain as we crossed the river. Mr. Sykes' house bears north-west ¼ mile south-west from our outspan.
29 19 10	D R							

APPENDIX—

Date.	Place.	Trocheameter. m.	tur.	yds.	ft.	in.	Latitude. South. ° ′ ″	Nature of Observation.
1870	Brought forward	6	3	76	2	7		
May 10 ..	Pull through rain swamp, and outspan.	3	4	78	0	0	19 42 30	D R
,, 10 P.M.	Sink in mud to the axles, break dessel boom.	0	4	70	1	9	19 42 30	..
,, 11 ..	Two hard treks through muddy soil, cross rivulet. Watson shoots a wolf.	1	6	68	2	6	19 42 20	..
,, 12 ..	Muddy hill and dale, wooded country.	0	7	33	2	9	19 42 20	..
,, 12 P.M.	Cross from spruits of the Songwe River, and outspan by the largest pool Jing-Ens, and below it.	3	0	142	1	5	19 42 20	..
,, 13 ..	Cross rivulet running to Changane.	6	0	61	2	11	19 42 0	..
,, 13 P.M.	Pass Inyangane or the Doctor's village, M'Sonto's, and outspan near it.	6	7	105	2	8	19 42 10	..
,, 14 ..	¼ mile north of Manpanjēni or Umbanjin, on M'nyami or Black River.	5	6	123	2	9	19 42 39	4 stars
	Total from Inyati Mission Station to Manpanjēni.	35	0	102	1	4		
,, 18 ..	From Manpanjēni or Umbanjin, across Changani and Dumas or Thomas Route, is a grassy ridge with thorns.	5	7	.. 162	0	4	19 42 39 19 38 50	4 stars D R
,, 19 ..	Cross Tyabensi River below islet.	2	4	57	8	6	19 37 10	..
, 19 P.M.	Cross Little Route. Grassy slope. Mopanies.	5	6	144	0	1	19 34 20	..
20 ..	Cross swampy valley, wooded slope.	1	7	61	2	5	19 33 30	..
,, 20 P.M.	Cross Little Um-Vungu, 30 yards wide.	3	4	213	0	2	19 31 40	..
,, 21 ..	Cross Great Um-Vungu ..	2	5	180	2	0	19 30 30	..
,, 21 ..	Cross last spruit of Um-Vungu	4	4	214	2	11	19 28 0	..
,, 21 P.M.	Cross Umgnamo or Knife River.	0	3	30	1	11	19 27 46	4 stars
,, 24 ..	Come to Makapukapa River	6	1	59	2	3	19 22 40	..
,, 24 P.M.	Cross Makapukapa and U. Gwelo to hill 1½ mile beyond.	2	7	0	1	2	19 21 23	4 stars
	Carried forward	35	5	25	0	9		

continued.

Longitude. East.	Nature of Observation.	Boiling Point.	Barometer.	Thermometer.	Maximum.	Minimum.	Height in Feet.	Remarks.
° ′ ″								
29 22 50	..	..	..	..	..	..	..	Country swamped wi heavy and long co tinued rains. The wa gons sink nave-de generally, and often the axles.
29 23 10								
29 24 10	..	..	..	..	..	..	..	Very cold, damp a misty. Waggon-whe ploughs up an eatal frog from its burro extreme length inches.
29 25 10								
29 28 0	..	..	..	..	..	..	..	Very heavy Deursla From this we get ha der ground, count generally more or le wooded; more ba towards the watersh on our right or sout and denser in the low country on our left north.
29 33 10								
29 40 0								
29 44 10	..	..	..	..	..	..	..	Umbainjin or Ma panjēnē is Umnomba village, but at this da he was away at t king's. We came he on the present occ sion to buy corn a goats, and hire men f the journey.
29 44 30	D R							
29 47 0								
29 49 0	..	204·8	..	65	..	..	3793	River-banks, black mu one hour making drift; shower at noo
29 52 30								
29 53 40								gentle continued ra at night. Waggo sink to axles in hea Deurslag.
29 55 30	..	204·8	..	..	..	..	3793	Joins Great Um-Vung about 6 miles below.
29 57 40								
30 0 10	..	204·8	..	..	..	..	3793	Rocky rivulet, de lanes.
30 0 50	..	..	..	..	..	..	..	Past spruit of U-Gwe
30 3 20	..	..	..	..	..	..	..	Outspan to make a drif
30 4 40	..	..	..	..	..	..	..	Inthaba Khoboli 4 or miles north-west.

APPENDIX—

Date.	Place.	Trocheameter. m.	fur.	yds.	ft.	in.	Latitude. South. ° ′ ″	Nature of Observation.
1870	Brought forward	35	5	25	0	9		
May 25 ..	Elevated plain, grove of khondjie or ughondjie-trees	7	0	183	0	10	19 15 0	..
,, 25 P.M.	Reach the road at Lunda Route.	5	6	31	1	7	19 10 55	3 stars
,, 26 ..	Cross Inchamba Route.	4	1	184	0	4	19 10 0	..
,, 26 P.M.	Cros U-Quaequae River, and outspan in grove 400 yards south-east of drift.	5	4	184	2	2	19 7 25	8 stars
	Total Manpanjēnē to U-Quaequae.	59	2	168	2	8		
July 13 ..	From Hartley Hill cross Umfuli and south-east to the hunter's convalescent camp.	9	7	84	0	8	18 7 52	1 star
,, 14 ..	Cross sources of Zinlundasi old camp.	8	7	10	0	1½	18 25 37	Ω
,, 14 P.M.	Cross Umzweswe River near its source.	7	7	71	1	4	18 29 26	3 stars
,, 15 ..	Cross sand spruit going north	6	4	91	1	10	18 27 0	D R
,, 15 P.M.	Cross four sand spruits come to another old camp.	8	4	3	1	10	18 24 40	..
,, 15 ..	Cross mud spruit	4	5	15	2	3	18 28 15	2 stars
,, 16 ..	Cross small and large spruit or Umgesi.	9	5	7	2	8	18 35 0	D R
,, 16 P.M.	Cross small spruit, stop short of deep spruit.	6	3	35	0	11	18 37 49	3 stars
,, 18 ..	Cross spruit of Umyati ..	9	7	45	2	4	18 42 49	Ω
,, 18 P.M.	Cross the watershed Umtigesi high lands, to spruit of Umsaabie.	7	1	49	2	8	18 44 40	1 star
,, 19 ..	Cross Poromadjen Route in valley.	6	4	147	2	3	18 45 0	D R
,, 19 P.M.	Cross Kitorok and Sepowie River and to Umtigezas village.	6	0	103	0	5	18 47 46	2 stars
	Total Hartley Hill to Umtigezas.	92	1	6	1	3½		
	Hartley Hill to Willie's grave	13 direct line E.S.E.					18 16 40	D R
	Down Umfuli on foot	25 winding course north-west.					18 1 30	D R
	To extensive abandoned workings.	21 nearly through N.W. by N.					18 0 0	..
	To workings resumed by Mashunas.	60 winding course N.N.W.					17 31 30	..

continued.

Longitude. East.	Nature of Observation.	Boiling Point.	Barometer.	Thermometer.	Maximum.	Minimum.	Height in Feet.	Remarks.
° ′ ″								
30 4 0	..	..	..	..	..	..	..	Grassy open country.
30 4 0	..	..	..	..	..	..	..	Patches of mopanie ughondie and other trees. Inthaba Umquaqua and sources of Ingwamyo, south-west.
30 8 0	..	..	..	..	..	..	..	Inthaba Siloquamdo and Siloquamdo rivulet S.E.
30 1 20	..	..	..	..	..	..	..	Inthaba Sequaequae, N. From this we proceeded by former road going direct to Hartley Hill.
30 54 10	D R	..	..	..	..	..	..	On the old road, by Zinlundasi route.
30 58 0	..	205·6	28·55	74	..	..	3367	Probably on source of Zinlundasi.
31 2 0	..	205·6	..	..	..	..	3420	In returning, a lion bites one ox fatally, and attacks another.
31 7 0	..	..	..	..	..	..	..	Leak's road turns north.
31 13 40	..	..	..	..	..	..	..	Thaba Enzimbe Iron Mountain, S.S.E.
31 15 30	..	205·4	Sand belt before reaching				3473	
31 20 20	..	205·3	Umgesi.				3526	
31 24 50	..	205·1	..	..	..	..	3632	Samara wooded. Sand belt, after crossing Umgese.
31 31 50	..	204·0	..	..	..	..	4221	Thaba Enzimbe, W S.W. Umyati goes south of Thaba Enzimbe.
31 37 00	..	203·1	27·90	..	..	..	4703	On the watershed.
31 41 30	..	204·7	..	..	..	..	3846	Granite hills on each side.
31 46 20	..	204·3	..	78	..	45	4060	On rough granite hills. We buy corn and pack-oxen, sheep and goats.
30 59 10	D R	W. J. Hartley, 29th May, 1870.						Inscription on tree, W. J. H. 29/5/70.
30 31 0	D R	206·0	..	..	..	..	3154	Tsetse fly.
30 36 0	..	With Mr. Hartley in vicinity of old round Portuguese house.						
30 32 0	..	With George Wood to his camp near Amakoonda's.						

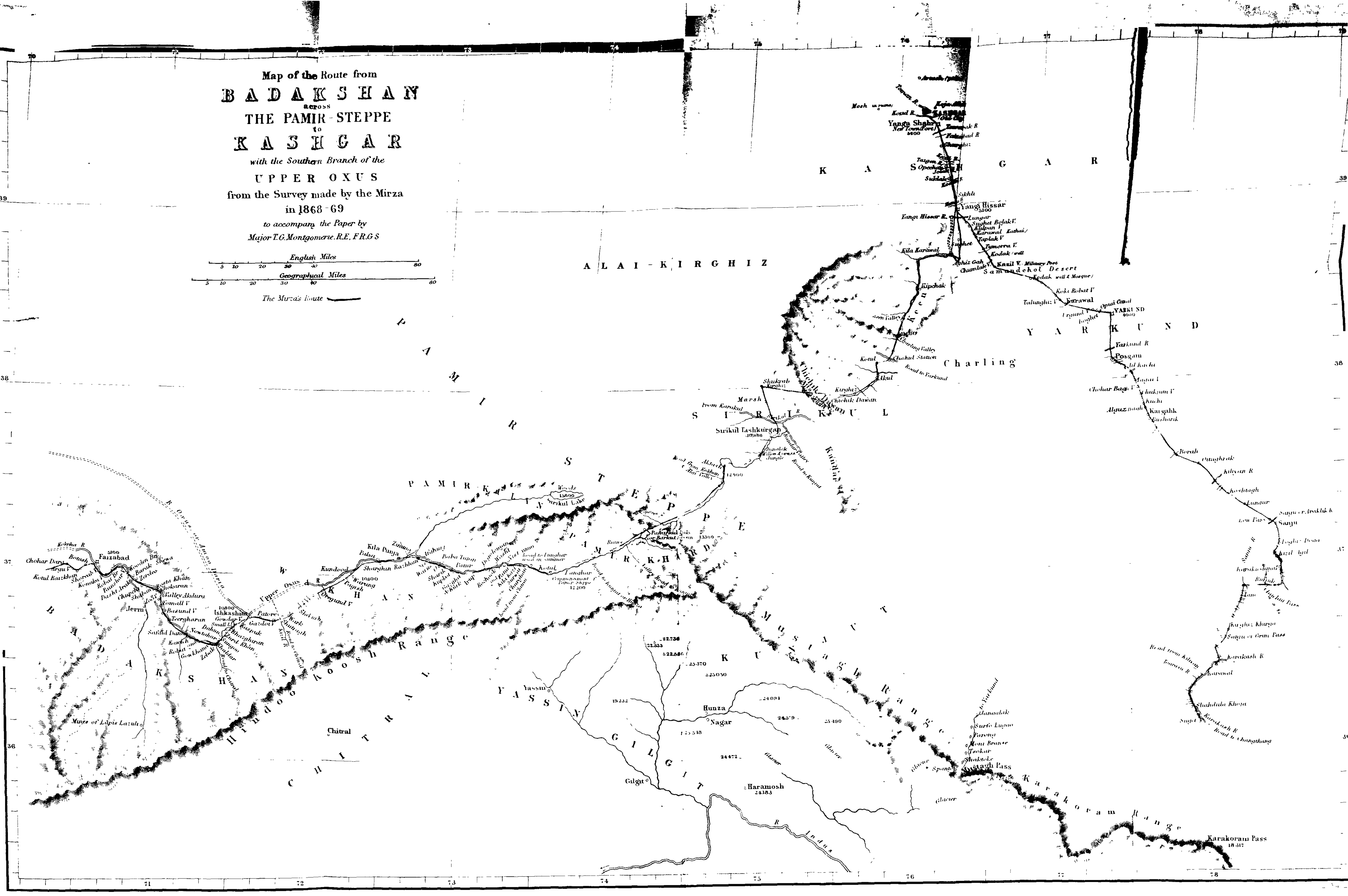
VI.—*Report of "The Mirza's" Exploration from Caubul to Kashgar.* By Major T. G. MONTGOMERIE, R.E., Gold Medallist R.G.S., Deputy Superintendent Great Trigonometrical Survey of India.

Read April 24, 1871.

THE present report will be chiefly confined to the explorations made by the Mirza in Central Asia, beyond the Hindoo Koosh, Mustāgh, and Karakoram ranges, which may be considered as a continuation of the great Himalayan system.

In carrying out my plan for exploring beyond the frontiers of British India by means of Asiatics, I have always endeavoured to secure the services of men who were either actually natives of the countries to be explored, or who had at any rate the same religion as the people, and who had been in the habit of travelling or trading in the said countries. Acting on this principle when the exploration of the Upper Oxus and Pamir Steppe was proposed, a search was made for a suitable native of some part of Central Asia. After a search in the Peshawur Bazaars, where men of nearly every tribe in Central Asia are to be found, and after applying to several of our frontier officers, it was found to be by no means an easy matter to get a proper man; any number of men are willing to volunteer for such a service, and, if their own accounts are to be believed, they are all well fitted for the task, but a very little inquiry however reduces the number of likely men nearly down to zero: many cannot write, others are too old, most have no ideas beyond those of trade, and nearly every one has special ideas as to what pay and rewards they are to get, and generally have special stipulations to make; all, however, apparently thinking nothing of the risks and exposure involved. The subject having been once broached, these men are difficult to get rid of, and fortunately in this present case negotiations were not entered into with any particular individual until a final decision was arrived at.

An itinerant silversmith seemed to be a likely man, as he was in the habit of making a round from Peshawur through Central Asia, starting *viâ* Caubul and returning through Yarkund, passing from city to city, and supporting himself by working up silver and gold into ornaments. Owing to the demand for men of his craft, there is no difficulty in their moving through Central Asia, but before any proposal could be made to this man he had started off on another trip, and it was consequently decided that a trial should be made with a former employé of the Survey, generally known as the Mirza, who was qualified in some respects. He had, as before stated, a partial English education, his father was



Map of the Route from
BADAKSHAN
across
THE PAMIR-STEPPE
to
KASHGAR
with the Southern Branch of the
UPPER OXUS
from the Survey made by the Mirza
in 1868-69
to accompany the Paper by
Major T.G. Montgomerie. R.E. F.R.G.S
English Miles
Geographical Miles
The Mirza's Route
KASHGAR
Yanga Shahr
New Town (Fort)
Yangi Hissar
Yangi Hissar R.
Kila Karawal
Kipchak
Charling
Charling Valley
Chahul Station
Road to Yarkund
Samandchol Desert
Karawal
YARKUND
Yarkund R
Posgam
Kargahk
Borah
Kilyan R
Koshtagh
Sanju
Kizil Igil
Karakash R
Karawal
Shahdula Khoja
Road to Changthang
Karakoram Pass
18 317
Karakoram Range
Mustagh Pass
Mustagh Range
ALAI-KIRGHIZ
SIRIKUL
Sirikul Tashkurgan
Chichik Dawan
Kundar
Aktash
12 900
PAMIR STEPPE
PAMIR KULAN
Sirikul Lake
15600
PAMIR KHURD
Pamirkul Lake or Barkut Yasin
13300
Langhar
12 200
Kotul
Baba Tangi
Kila Panja
Kundood
Upper Oxus R
WAKHAN
Oregund V
Ishkashim
10800
Patore
Gazdoi V
Zebak
Hindoo Koosh Range
BADAKSHAN
Faizabad
5100
Kokcha R
Chohar Darya
Jerm
Mines of Lapis Lazuli
R. Oxus or Amoo Darya
CHITRAL
Chitral
YASSIN
Yassin
GILGIT
Gilgit
Hunza
Nagar
Haramosh
24183
KUNJUT
R. Indus
70
71
72
73
74
75
76
77
78
79
36
37
38
39

a Turk of Meshed engaged in trade, his mother a native of Persia; the Mirza himself was born in Persia, and understands both the Persian and the Turkish languages. His father's trade took him to Herat, and there he was in some way connected with Major Pottinger when defending that city. His son, the Mirza, made his way down to India, and managed to get some education through the kindness of various British officers. He was consequently in many ways fitted to carry on explorations, and at one time he had moreover been employed on survey work near Peshawur. Subsequently he had spent a great deal of his life in Caubul, &c.

Returning to India when the Amir Sher Ali was dethroned, the Mirza had nothing to do, and was consequently glad to get employment on a surveying expedition. He was brought down to the Survey Head-Quarters, and, having done nothing in the way of surveying for many years, was put through the regular course of training for explorers, and then sent up to Peshawur at the end of 1867. He was directed to make his way into Badakshan by the Chitral route, if possible, or by any other route that was feasible, and from thence to explore the Upper Oxus, the Pamir Steppe, the routes to Kokan, Kashgar, &c. Owing to the lateness of the season he was unable to go by Chitral, and for various reasons was unable to get to Caubul by any of the ordinary routes. After trying several routes he had to go down the Indus to Sukkur and thence by the Mālā Pass to Khelat in Beloochistan.

From Khelat he made his way to Candahar, arriving there just as the Amir Sher Ali's forces captured the place. He was allowed to accompany the Amir's army during its successful advance upon Caubul.

Owing to the disturbed state of the country the Mirza was greatly delayed, and had much difficulty in getting out of Caubul. After many disappointments he succeeded in starting for Badakshan in October, 1868.

From Caubul he made his way northwards over the Hindoo Koosh range by the ordinary route to Bamian, and thence down to Khulm Tashkurgan, a town about 20 miles from the river Oxus. From Khulm he marched eastward through Badakshan, following the route that runs 20 to 30 miles south of the Oxus as far as Rustak. Thence he followed the course of the Kokcha River, a great tributary of the Oxus, then crossing from the head of the Kokcha Valley, he passed over into the valley of the Upper Oxus, first meeting that great river at Ishkashim, from thence marching up the stream nearly due east, he reached the Punja fort in Wakhan.

His march up to Punja had been trying, as it was made during

midwinter. Snow fell very often and added not a little to the Mirza's troubles, but as villages were forthcoming at each halting-place, none of the party were much the worse for the journey. The Mirza's servants had however got rather mutinous, and he consequently was subjected to the usual fate of explorers in having to contend with a course of camp intrigues, and all its resulting annoyances. Up to this point, Punja, on the Upper Oxus, the Mirza's journey can be followed and tested by the route of the intrepid explorer Lieutenant Wood, of the Indian Navy. Nearly every point can be identified, and, with the exception of some few variations near Faizabad, the routes are identical. The Mirza's work agrees pretty closely with Lieutenant Wood's, and his positions of the chief places differ but little from those of Wood; Punja itself being by the latter in lat. 37° 2′ and long. 72° 41,'* and by the Mirza in lat. 37° 5′ and long. 72° 39′; a very close agreement, bearing in mind that the points referred to may have been some miles apart, there being no means of determining exactly the respective points where the observations were taken.

In referring to the Mirza's explorations at the end of my last year's report, I stated that he had made his way from Badakshan through the Upper Valley of the Oxus to Wood's Sirikul Lake. This, however, as will be seen below, was a mistake; it should have been to the Pamir-kul Lake, on the southern branch of the Upper Oxus, Wood's Sirikul Lake being on the more northerly branch of the same river. The mistake arose from the Mirza stating that from Punja he had gone to a lake a few marches beyond Punja, and then on to Kashgar. As soon as his work was compiled it was evident that it was another lake.

At page 331 of Wood's 'Oxus' he states that, "the Valley of the Oxus may be said to terminate at Issar, to which point from Ishkashim, in lat. 36° 42′ 32″ N., its direction is E. by N. ½ N. The latitude of Issar is 37° 2′ 10″ N., and its height above the sea 10,000 feet. Here the main valley divides into two, which, when a little beyond Kila-Panj, bore respectively E. 20° S. and N. 40° E. The former, we were told, conducted into Chitral, Gilgit and Kashmir, and the latter across the table-land of Pamir to Yarkund in China. I had now to ascertain, if possible, which of the two streams I was to trace. One of them, it was certain, must lead to the source of the Oxus, but which of the two was a question of difficulty. The Kirghiz had unhesitatingly told us that the object of our search was to be found in a lake upon the 'Bam-i-duniah,' or roof of the world in Pamir, and that the road to it was up the durah of Sir-i-kol; but though

* From his last set of Chronometric Observations.

the northerly direction of that valley, and of the countries to which it led, was, when compared with the Mastuch, as the Chitral durah is sometimes called, almost sufficient evidence in favour of Sir-i-kol, I thought it prudent to visit the junction of their respective waters. To my eye the stream of Sirhad, as the river from Mastuch is frequently called, appeared the larger, but the Wakhanis held a different opinion. That from Pamir was divided into several channels, and frozen, so that its aggregate volume could not be well ascertained, though from a clearing in its principal stream I inferred its velocity to be double that of the Sirhad, while its temperature was five degrees lower, being 32°, and that of the other 37°. It seemed a singular circumstance, but certainly confirmatory of the superior height of the source of the river Pamir to that of the other stream, that it should be sheeted with ice to the very point of their junction, whilst the Sirhad was unfettered by the frost, and had a slower current and a higher temperature. According to my informant, the Pamir branch in summer brings down much more water than the Sirhad, though the latter has many tributaries, and the former but two trifling rills, those of Langer Kish and Zerzamen."

The Upper Oxus, which flows past Punja, is formed by two streams which meet just to the east of Punja. From Punja onwards the Mirza's route diverges from that of Lieutenant Wood, who took the northern branch of the Oxus, whilst the Mirza followed the more southerly branch.

Lieutenant Wood, from looking at the two branches, had, as will be seen above, come to the conclusion that the southern branch was the larger of the two, and from the Mirza's route it would appear that Wood's eye had judged correctly. The southern branch is considerably larger than the other, and it is fed by several large tributaries, whilst the northern one has hardly any, and those all small. Wood's guides, however, insisted that the northern was the main branch, and it appears that its source is higher than that of the southern one, and hence, probably, the reason why the northern branch was frozen and the southern one not frozen when Wood saw them. Whichever may have the honour of being the main source of the Oxus, there is no doubt but that the two combined form the Upper Oxus River, and as Wood had explored the northern, it is fortunate that circumstances should have made the Mirza explore the southern. We have now got both, and can account for nearly all the drainage of the Upper Oxus.

At Punja the Mirza had great difficulty in arranging for crossing the Pamir Steppe. The Mir of Wakhan gave him a pass, and ordered certain men to accompany him; but it was only after bribing this petty Mir and his officials that he could

get the order acted on. Then his guides frightened his servants by the worst stories they could invent as to the cold and hardships of the route, and the danger of being caught by either the Kirghiz or Kunjúti robbers. The Mirza was now at about 10,000 feet above the sea, and, being winter, snow was constantly falling. This alone was sufficient to make his servants troublesome, and what with the intrigues of the Mir's officials, and the guides' stories, they became very mutinous; but at last, after dismissing these old guides, the Mirza was able to make a start on the 14th January, 1869. For three marches, as far as the village of Patur, the party did not suffer much from the cold, as they could always get shelter in a village. Beyond Patur they were informed there were no villages for eight marches, and provisions had to be carried with them.

Fortunately the extreme cold enabled them to carry meat on their ponies, and, as far as food was concerned, they were pretty well off. The party, however, suffered very much from the cold; it snowed every day, and they had generally to sleep on the snow. After the fourth day they reached the watershed of the Pamir Steppe, between Wakhan and Eastern Turkistan. The rivers were all frozen, and the source was evidently a small frozen lake, called Pāmir-kul or Barkūt Yāssin. The ice of the lake and the flat ground around were covered with snow, and the Mirza could not consequently decide exactly where the lake ended and the land began; however not very far to the east of the lake the fall of the country to the eastward was quite perceptible.

This Pamir Lake is about 13,300 feet above the sea. The Mirza thinks that some of its water flows to the west, and some to the east; but, as all the streams were frozen, this cannot be considered as established. As far as my experience goes, no lake in the Himalayas has two exits, nor do I think that it is common elsewhere; and indeed I know of but one case of the kind where a small pool has two exits, and it is obvious that if there is any great flow of water, one exit will probably be cut quicker than the other, and eventually become the sole channel.

The watershed of the Pamir Steppe is, however, close to the Pamir Lake. The Mirza descended gradually from it, and after four long marches found himself at Tashkurgan (Stone Fort), the capital of Sirikul, which is only 10,986 feet above the sea; the stream which he had followed down had become very large, and was clearly flowing eastward towards Yarkund.

The last four marches were an improvement, but there was still a great deal of snow on the ground, even round Tashkurgan. The Mirza was now in the Atalik Ghazi's territory, his troops

having, however, only taken possession of it about ten days before the Mirza arrived. The Governor in command decided to send the Mirza on to Kashgar under a Kirghiz escort; but fortunately a certain amount of liberty was allowed him, the Kirghiz knowing very well that he could not run away.

From Sirikul the Mirza marched down to the main Sirikul River, which he crossed on the ice; he then made his way over the Chichik Dawān Range by a very high and steep pass, covered with snow and ice, probably about 15,000 feet above the sea. After five very hard marches over snow, the party arrived in the Keen Valley; each day they halted at a Kirghiz encampment, and got shelter in one of the tents. From Keen three more long marches over snow took them to the small town of Yangi Hissar, and two marches farther north brought them to the new town, or Yanga Shahr, of Kashgar, about five miles south-east of the old city of Kashgar.

The Mirza arrived at Kashgar on the 3rd of February, 1869, after a most trying march, snow actually falling during the last two days, and lying pretty heavily on the ground.

The Mirza had carried on a route survey from Caubul to Badakshan, and thence to Kashgar; the bearings being taken with a good prismatic compass and the distances measured by pacing, the Mirza and two or three of his men relieving one another in doing so. They carried a string of beads in their hands, dropping one at every 100 paces, and having a large bead at every tenth to represent a thousand feet.

Observations for latitude were taken of the sun and stars at various important points, such as Caubul, Khulm, Faizabad, Sirikul, Kashgar, &c. These latitude observations can be compared with those of Griffiths and Wood as far as Punja; the results generally agree within two or three minutes, quite as close as could be expected, considering that no two explorers are likely to observe from the same point—Caubul, for instance, being, with its outskirts, a straggling place, running two or three miles either way, and everything depending upon what point is referred to. Though the Mirza's observations are not very first-rate, yet still, judging from the points common to him and to Griffiths and Wood, as shown in Appendix, it may be concluded that the latitudes of new points, such as Sirikul and Kashgar, are within about five minutes of the correct latitudes.

As to longitude, the new values must depend upon the accuracy of the Mirza's pacing, as the route runs too much east and west to enable the latitudes to act as a very strict test for the whole.

The longitude of the starting-point, viz., Caubul, has been derived from former maps, on the authority of Lieutenant (now

Sir Henry) Durand, and Lieutenant (late Major) Anderson, both of the Bengal Engineers, viz., E. 69° 5′ 5″. The Mirza's latitude of Caubul has been accepted, as his measurements start from his point of observation. From Caubul his route to Khulm, running mostly to the north, has been used in combination with the Mirza's latitude of Khulm to determine Khulm, giving lat. 36° 37′ N., long. 67° 47′ E. for that place.

The value of the Mirza's mile, as tested by the difference of latitude between Caubul and Khulm, is 0·15 in excess of a mile, about the amount that a mile, as measured on a rough up and down road, crossing the great Hindoo Koosh Range, might be expected to differ from a mile measured on flat ground at the level of the sea. It is, of course, difficult to say how much of this difference is due to the number of the Mirza's paces, viz., 2300, that have been assigned to the mile.

From Khulm to Kashgar, a distance of about 500 miles, there is not sufficient northing to determine the value of his mile; it was consequently decided to determine Kashgar from Yarkund, which had already been fixed by another explorer. Taking Yarkund as in lat. 38° 20′ N., long. 77° 30′ E., and using the Mirza's route for distances and bearings, and his latitude of Kashgar, it appears that 39° 26′ and 76° 16′ is the position of the new city, and lat. 39° 29′, long. 76° 12′, for the old city of Kashgar.

I must note here that the Mirza carried his route survey on to old Kashgar, which he visited three times, and has consequently been able to give some description of that ancient city. Messrs. Hayward and Shaw had not the opportunity of visiting the old city, owing, I suppose, to the suspicions of the Atalik. The Mirza only got there by bribing his guard, which he, no doubt, was able to do more easily than a European, and probably with less risk. The Mirza's position of old Kashgar is, therefore, as yet the only one, from this side of India, that has been derived from actually visiting the place.

Some error has been made in the Royal Geographical Society's 'Proceedings' * as to Mr. Hayward's values, as it is there stated that the old and new city are in the same meridian, and though said to be only five miles apart, yet the one is given as differing from the other by ten minutes of longitude. Judging from Mr. Hayward's map, 76° 10′ is the longitude he assigned to both new and old Kashgar. Both he and Mr. Shaw state that the old city is due north of the new town; but the Mirza having gone there and giving a bearing of 312° (or 48° west of north), the latter has been adopted in deducing the longitude of the old city.

* Page 69 of vol. xiv., No. 1, of Royal Geographical Society's Proceedings.

The value of the Mirza's miles, tested by the difference of latitude, shows it was 0·07 in excess—the excess being, as was to have been expected, less than that found on the rough road between Bamian and Khulm; the roads between Yarkund and Kashgar being, on the other hand, very fair and almost level. Taking the positions of Khulm and Kashgar, as determined above, it appears that the direct distance between them should be 494 miles; the Mirza's measurement gives 484 miles, taking the miles as equal to 2300 paces, showing that each of his miles is about 0·02 in defect, or in other words, showing about 2 per cent. of error.

From this it may be concluded that, on an average, the assignment of 2300 paces to the mile is tolerably correct; but as the pacing was done by three or four men relieving one another, and it is not known how much each individual did, it is impossible to deduce much from the comparison of the pacing of any one portion with another, but, viewed as a whole, the pacing appears to have been good, and, considering the mountainous nature of the country, the many marches over snow, and the fact that the Mirza was for a considerable portion of the time under a sort of open arrest, with people watching him, it is surprising that such good results have been obtained.

The positions of the chief places between Khulm and Kashgar have been deduced by applying the above correction to the Mirza's distances, giving as follows, viz.:—

	Latitude.	Longitude.	Height.
	° ′	° ′	
Khulm (Tashkurgan)	36 37	67 47	..
Kunduz	36 45	69 4	..
Rustak	36 59	69 51	5,100
Faizabad	37 2	70 36	5,100
Ishkashim	36 45	71 38	10,800
Punja	37 5	72 39	..
Pamir Lake, or Barkūt Yassin	37 14	74 18	13,300
Sirikul (Tashkurgan)	37 44	75 13	10,986
Yangi-Hissar	38 58	76 26	5,100
Kashgar, Yanga Shahr, or new town	39 26	76 16	5,200
Kashgar old city	39 29	76 12	..

I had wished to have got another independent value of the longitude of Yarkund, but the Mirza only carried his route survey from Yarkund to Shahdula, on the Karakash River. He did not carry it farther, as he was under the impression that the route up to that point had been regularly surveyed. This, however, was not the case, Shahdula not having been connected with the trigonometrical stations on the Karakoram, as expressly

stated by Mr. Johnston (who made a rough sketch of that portion), and in consequence having been put to the east of its proper position.

Had the Mirza carried on his route survey to the Karakoram, his work would have supplied full data for testing the position of Yarkund; as it is, his route to Shahdula gives 187 miles out of a total of about 240 miles. I have consequently had the said 187 miles computed out, and taking the accepted longitude of Yarkund, viz., that from Hameed, I find that the Mirza's route would put Shahdula in about five or six minutes to the west of Hameed's longitude of the same point, showing but a small difference, and in no way sufficient to throw any doubt on the substantial accuracy of Hameed's work.

In deducing the positions of unknown places from the surveys of my explorers, I have always been careful to use places with established positions as starting-points, and I have refrained from using the materials of previous, or of other explorers, unless I was aware how their measurements and observations had been made, and considered that the results were likely to be good; I have, however, always closely examined all other available materials in order to see and inquire into any differences between them and those of my own explorers.

In the present instance I have examined the material supplied by Messrs. Hayward and Shaw. Mr. Hayward, in a route supplied to the Punjab Government, gives the distances between Leh and Yarkund, and makes the distance from Yarkund to Shahdula 190 miles, the Mirza making the same 187 miles—an immaterial difference, as variations in the route, which are known to be numerous according to the state of the rivers, would easily cause much greater. Mr. Hayward does not state how he measured his distances, and gives no bearings; he, however, observed for latitude at Yarkund, and in the Royal Geographical Society's 'Proceedings'* has stated that his resulting position of Yarkund agrees practically with that which I have deduced from my explorer's work.

Mr. Shaw has also supplied a route from the Karakoram to Yarkund. He gives both distances and bearings. He states that his distances were measured in tashes of about 12,000 paces each, the length of a tash having been estimated by pacing a tash, and the number of tashes on the whole route having been estimated by timing, based on the time it took to traverse the measured tash; a tash being a measure used in Eastern Turkistan, which is assumed to be about five or four and a half miles in length. Mr. Shaw, judging from his map, has also

* Page 65 of vol. xiv., No. I.

retained the latitude and longitude deduced from my explorer's work.

No bearings being available from Mr. Hayward's published statements, it was impossible to examine his results any further. Mr. Shaw, however, supplying bearings as well as distances, it has been possible, by assuming the latitude of Yarkund to be 38° 20′, to compute out the position of Yarkund with the G. T. Survey value of the Karakoram Pass as an origin. This has been accordingly done, and with the above latitude Mr. Shaw's route would put Yarkund in about long. 77° 27′, agreeing practically, in fact, with the value I have deduced from Hameed. The same computation, however, shows that the longitude of Shahdula would be somewhat to the east of Hameed's longitude of the same place, and, judged by that, Mr. Shaw's route would have a tendency to make Yarkund more to the east, too.

From the above, it will be seen that, there are no grounds for altering the longitude I have assigned to Yarkund, and that on the other hand there is a great deal to show that the said longitude, viz. 77° 30′, is substantially correct; I have consequently decided to adhere to it. No doubt some alteration will be required when the distances and bearings have been regularly measured with a chain, and when the latitude has been determined by a practised observer; but the alteration will probably be but small, judging from the data at present available. The longitude of Kashgar would, of course, be altered by the same amount.

The heights depend upon boiling-point observations, but they are not numerous, and, owing to breakages, depend upon inferior thermometers; and, consequently, cannot be considered final. They, however, give a fair approximation to the comparative heights of the various places.

The Mirza, unfortunately, had not had much previous practice in the use of thermometers; and, owing to the great delays in commencing his route survey, had, to a certain extent, forgotten the instructions given to him at the G. T. Survey Head Quarters. A greater number of observations at each large place would have been of much value, and, no doubt, given a better average; but what with the disturbances in Afghanistan, and the anxieties of his journey, the Mirza forgot this, and his latitude observations suffered to a smaller extent from the same cause, and another very important point, viz. bearings to distant peaks, was entirely neglected.

This latter, however, may not be entirely due to the delay in putting his lessons into practice, as I have observed that all of the explorers have done but little in that way on their first

expedition, being too busy trying to secure everything connected with their actual route, and thinking but little of peaks in the distance; the Mirza in this instance being of opinion that there was little necessity for bearings to distant peaks, as his route actually led him over the highest ground, an opinion, however, which I cannot altogether concur in, as I know that some of the high peaks determined by my Trigonometrical Survey operations were within 40 miles of the point where he crossed the Pamir, and some, with a little extra observation, would, no doubt, have been seen.

The recognising of distant peaks from different points of view is, however, a difficult thing, and requires a considerable practice before success can be secured; it is consequently easy to excuse the Mirza's omissions in this respect.

The Mirza's route gives us another determination of the great watershed which separates Eastern Turkistan from the basins of the Indus and the Oxus, viz. the Pāmīr-kul Lake, which comes between the Mustagh Pass (the most westerly point actually on the watershed determined by my survey operations) and the Sirikul Lake of Wood; and this new determination confirms the opinion that I have held for many years, that the said watershed continues to run north-west from the Mustagh,—a conclusion which I came to from the positions of many gigantic peaks fixed by the survey to the north-west of the Mustagh, which peaks, though probably not on the watershed, doubtless indicate its general direction. From the Changchenmo east of Leh to the Mustagh, the general line of the watershed is about 35° north of west, from the Mustagh to Wood's Sirikul it is about 38° north of west, and the same line would nearly run through the Pāmīr-kul. Further to the north I am not inclined to think that the general direction of the watershed alters very rapidly.

The Mirza in marching from Sirikul to Yangi-Hissar passed some very high peaks to the west of his route. These are some that have been seen by Messrs. Hayward and Shaw when they went to Kashgar. The peaks are no doubt closer to Yangi-Hissar than the watershed given in Colonel Walker's map of Turkistan; but, judging from the position of the great Himalayan peaks with reference to the main watershed all the way from Assam to Little Tibet, the chances are in favour of the main watershed being very considerably behind, or to the west of those peaks. Such has almost always been found to be the case when surveyors have been able to fix the Himalayan watershed.

I consequently conclude the watershed north of the Sirikul Lake, will not require to be moved much more to the east than

is indicated by the alteration in the position of Kashgar. The Tarik Pass, on the said watershed, is known to be 11 marches, say 150 miles west of Kashgar; that, and the size of the rivers near Yang-Hissar and Kashgar, coming from the west, all tend to confirm the above.

The position of Kashgar, deduced from the Mirza's work, is to the east of the position assigned to it in the map of Turkistan, an alteration which I had anticipated many years ago when trying to fix the longitude of Yarkund, the probability of its being further east being great.

The positions assigned to the chief places in Eastern Turkistan may now be considered to be accurate enough for all general geographical purposes. The alterations made in their positions are very remarkable. About ten years ago, judging from the results of my survey of the Karakoram and Mustagh ranges, I ventured to conclude that the positions assigned to places in Eastern Turkistan by Humboldt in his 'Asie Centrale' were not in accordance with the more modern information collected in British India.

Humboldt's positions being founded on those by the French Jesuits, I concluded, (*vide* vol. xxxvi. p. 168, of Geographical Society's Journal,) that Yarkund was considerably to the east of the position derived from the Jesuits. This was subsequently confirmed by one of my explorers, Mahommed-i-Hameed; and at page 169 of the same volume, I published a table giving the positions as they then stood. A glance at the table which I re-introduce below, with the additions up to this date, will show how they now stand, viz:—

Name.	By the French Jesuits as in 'Asie Centrale.'		By Schlagintweits.		By Capt. Montgomerie, from Hameed.		By Capt. Montgomerie, from his Explorers.		Remarks.
	Latitude.	Longitude.	Latitude.	Longitude.	Latitude.	Longitude.	Latitude.	Longitude.	
Yarkund . .	° ′ 38 19	° ′ 76 16	° ′ 38 10	° ′ 74 10	° ′ 38 20	° ′ 77 30	° ′ 38 20	° ′ 77 30	Khotan from Mr. Johnson.
Ilchi (Khotan)	35 50	80 33	36 50	78 20	37 37	78 57	37* 7	79 24	
Kashgar . .	39 25	73 57	39 15	71 50	39 25	75 21	39 29	76 12	
Sirikul (town)	..	..	..	..	38 10	75 39	37 44	75 13	

Hameed, the first of my explorers, visited Yarkund; and up to this date, as shown above, it appears that the position of Yarkund, derived from his observations, is practically correct; but in deducing the position of Kashgar from Hameed's bearing,

* As stated in pp. 228-229, No. III. of vol. xiv. of the Royal Geog. Society's Proceedings.

&c., I erred, as may be seen above, in not putting Kashgar still farther to the east; but as it was, I had put it farther to the east than the correction to Yarkund suggested, and I did not feel warranted in shifting still farther the position of a place which had not then been actually visited by my own explorers, and whose position had been given by the Jesuits, who were said to have visited it.*

With reference to Sirikul (Tashkurgan), which, as far as I know, had not been previously fixed, the position I derived from Hameed's bearings, &c., is a very good approximate one, as tested by that from the Mirza, who visited the place.

As far as Kashgar is concerned, I notice that the Russian explorers have come to the conclusion that the old value of the longitude would require an alteration of about 2° to the east; this would put Kashgar in long. 75° 57′, or 14′ west of the longitude I have adopted. This determination is, however, stated to depend upon only one point, which was fixed astronomically, viz. the western extremity of the Issikul Lake, which may itself require altering.

Baron Osten Sacken says that he was informed that Kashgar was to the east of Artush, he, himself, being at that time, according to the Kirghiz with him, within 8 miles of Artush and 20 miles of Kashgar. I am glad to be able to confirm the information given to the Baron; the Mirza went out from Kashgar 3 or 4 miles on the road towards Artush, and he found the general direction of that place to be 20° west of north from Kashgar at a distance of one day's march, or 13½ miles. If the Baron Osten Sacken's route is now, or hereafter, well connected with properly-fixed positions to the north, it is to be hoped that he may be able to give us the position of Kashgar, as derived from the Russian side.

The alterations in the positions of Kashgar and Yarkund in a great measure explains why Marco Polo in crossing from Badakshan to Eastern Turkistan went first to Kashgar and then to Yarkund. With the old positions of Yarkund and Kashgar it appeared that the natural route from Badakshan would have led first to Yarkund; with the new positions and guided by the light of the Mirza's route, from which it is seen that the direct route to Yarkund is not a good one, it is easy to understand that a traveller might prefer going to Kashgar first, and then to Yarkund. It is satisfactory to have elicited this further proof of the general accuracy of the great traveller's account of his journey through Central Asia.

* There can be no doubt that the Pp. da Rocha and Espina were at Yarkund and Kashgar with the Chinese army in 1759. See 'Lettres Edifiantes,' Rec. xxxi. pp. 241–248, and 'Ritter,' vol. vii. pp. 346, 522.

The climate of Kashgar seems to be somewhat colder than that of Yarkund, probably owing to its being farther north and somewhat higher than Yarkund. It is also healthier, the Yarkundies suffering from the effects of impure water. Goitre, moreover, is very prevalent in Yarkund, while it is unknown in Kashgar, possibly because the Yarkund River rises from among glaciers, goitre being often common where glaciers are numerous.

The account given of the Atalik Ghazi, the present ruler of Yarkund, is a curious one; according to the Mirza, the Atalik is a good soldier, and generally believed to be so by people about him. I, however, could learn nothing to prove this—he appears rather to be a bold intriguer.

As far as the expulsion of the Chinese from Eastern Turkistan is concerned, it was in the first instance effected by the Kūchāri and Tungāni chiefs with their men who formed the great part of the Chinese auxiliary troops. These men mutinied in consequence of the oppression of the petty Chinese officials, a tax on every adult male being apparently the final provocation. After a good deal of severe fighting they got the upper hand and shut up the Chinese in their forts. As soon as their success was known, numbers of armed Mahommedans, dubbing themselves as Ghazis, flocked in from Kokhan, Andijan, Badakshan, &c., and the Chinese were completely cut off from China Proper. The Chinese had sent messengers to ask for reinforcements, but owing to the state of Kūchār, a mountainous country towards China, reinforcements were not sent. The Chinese garrisons, after holding out for a year, and getting no help, resolved to give in. The chief officials, Ambans, &c., were said to have blown themselves up after spitting towards Pekin, while the common Chinese, to the number of about 2000, consented to become Mahommedans, and were after the usual rites released.

Wali-Khan Khoja took possession of Kashgar while the Kūchāri chief took possession of Yarkund. The new rulers were, however, not popular, and the Atalik, who had been sent to assist the Mahommedan Ghazis in reducing the Chinese, was able, by well-planned intrigues, to make Wali-Khan leave Kashgar and fly to the mountains; Yarkund after that fell into his hands without firing a shot. The Atalik then marched towards Khotan, which had fallen into the hands of Haji Habbiboollah Khan; he invited Habbiboollah to a conference, and disposed of him by the simple expedient of treacherously murdering him, and all his male relations. The latter, according to the Mirza, were included, so as to prevent any disagreeable consequence in the shape of a blood feud, male

relations being bound to revenge the murder of one of their family.

The Atalik having thus disposed of all rivals, secured the undivided control of all Eastern Turkistan, &c., and he then, for the first time, assumed the title of Atalik, which means father-like. From the Mirza's account, the Atalik is not very popular; his petty officials seem to oppress as much as those of former rulers, and the respect in which he is held depends mostly upon his devotion to Islam, and his want of scruples in other matters. Except that there is at present no other rival in the horizon, it might be supposed that his reign would not be a very long one. Already we hear of his having to take the field against the Tungānies, and it is probable that similar outbreaks may occur elsewhere. The Government of Eastern Turkistan therefore can hardly be considered to be a very stable one.

The country generally between Caubul and the Oxus appears to be in a very lawless state; slavery is as rife as ever, and extends through Hazara, Badakshan, Wakhan, Sirikul, Kunjūt, &c. A slave, if a strong man, likely to stand work well, is, in Upper Badakshan, considered to be of the same value as one of the large dogs of the country, or of a horse, being about the equivalent of Rs. 80. A slave girl is valued at from four horses or more, according to her looks, &c.; men are, however, almost always exchanged for dogs. When I was in Little Tibet, a returned slave who had been in the Kashmir army took refuge in my camp; he said he was well enough treated as to food, &c., but he could never get over having been exchanged for a dog, and constantly harped on the subject, the man who sold him evidently thinking the dog the better animal of the two. In Lower Badakshan, and more distant places, the price of slaves is much enhanced, and payment is made in coin.

The Khirghiz tribes, though looking after their herds and flocks, seem to plunder without much check, while the Kunjūtis carry on highway robbery as a regular profession, doing very little else, and consequently being the pest of all Kafilas, which, unless large, are apt to fall a prey to them. There is some delicate distinction between the Khirghiz and the Kunjūtis, the latter being always made out to be the worse pest of the two.

I have studied Kunjūt from the southern side of the Mustagh, and was interested to get a few further details about it, as gathered on the northern side of the range. From what I have heard, I make out that Kunjūt was originally a small territory south of the Mustagh, on the great eastern branch of the Gilgit River; it was generally known as Hunza, or Hunza-Nagar, from two small towns on the said branch. The Hunza people were

always noted for their plundering incursions into Little Tibet, appearing suddenly above Shigar by a very difficult road, which the survey operations have proved to run over a glacier nearly 64 miles in length, *i.e.* over 30 miles of ice on each side of the pass.

They also poured down on the Yarkund road north of the Mustagh, probably by a similar route; for, whenever the rulers on either side tried to punish the Kunjūtis, the troops were entirely baffled by the difficult roads, there being apparently no easy entrance. The Kunjūtis, in their fastnesses, continue to defy every one, but they have latterly extended their territory to the north of the range, and now occupy several districts on the more westerly branches of the Yarkund River, and so far are, perhaps, more vulnerable than formerly.

The Ruler of Kunjūt seems to have amicable relations with neighbouring states; the Mirza passed a Vakil from Badakshan, on the Pamir, who was going to Hunza, the capital.

The Kunjūtis are said to be a very intelligent set; they are better educated than most Mahommedans, and many of them are said to go to Kashmir, Badakshan, &c., in order to complete their education. They are all Shiá Mahommedans. The Government is probably well established, as I know they have a mint, having in my possession a few well-stamped coins of various sizes made of gold, mixed largely with copper; the coins have the word Gujanfur on them, the name, I suppose, of some emblematic animal.* I was, however, unable to find out its meaning.

The Kunjūtis appear always to get the better of the Khirghiz, having taken possession of the huts of the latter near Lunghar, &c.; this superiority no doubt is due to their greater intelligence. They appear to be a much more warlike set than their neighbours in Gilgit and Little Tibet. I understand there is some distinction between the men of Hunza and those of Nagar, though only separated by a river; the Nagaris are said to be the milder set of the two. The troops of the Maharaja of Kashmir have overrun Gilgit, but I believe no serious attempt has been made by them to subdue Kunjūt, even as far as the part south of the Mustagh is concerned, and yet the route from Gilgit up the river must be a tolerably easy one. The reason why the Kunjūtis have been let alone is, no doubt, the knowledge that they would be a tough enemy to subdue, and a very difficult people to hold in subjection. They have at times given a great deal of trouble on the borders of the Maharaja's territory, and had it been easy to bring them into subjection, it would, no doubt, have been done long ago.

* Perhaps *Ghāzānfār*, which the dictionaries give as an Arabic term for a lion.

The limits of the area which the Kunjūtis can occupy are now pretty well defined, and they cannot well have more than 9000 square miles; more than half of this area must, however, be uninhabitable, owing to its great elevation, including as it does some of the highest peaks on the globe, ranging from 20,000 to 28,300 feet above the sea, with many enormous glaciers ranging in length from 10 to 32 miles, forming, in one place, a continuous mass of ice 64 miles in length, the largest glaciers in fact known out of the Arctic regions. The survey operations have given the positions of all these peaks, and enabled us to determine that of Hunza-Nagar itself to be in lat. 36° 15′ N. and long. 74° 43′ E., which is probably correct within two or three minutes. The Hunza-Nagar Valley is a high one, though the towns are probably not above 6000 or 7000 feet. The people are said to have but little cultivation, and to live chiefly on meat and dried fruit. The farther elucidation of the history of this remarkable tribe is a desideratum as they seem to differ from all others around them.

The Valley of Sirikul or Sirikol, as the Mirza pronounces it, has hitherto been only known by hearsay; it is apparently a fine valley, quite walled in with mountains, and having little more than a gigantic chasm, viz. the Tangitár, for the exit of its river.

In my first memorandum as to the position of Yarkund, I stated that Sirikul was supposed to be the stronghold of Afrasiab; the Mirza heard the same story; and the great extent of its ruined stone fort, Tashkurgan, proves it to have been a place of importance, possibly as a refuge in case of disaster. It was not ascertained whether the builder of the fort was the actual conqueror of Persia or one of his descendants,—Afrasiab being a family name, it is of course doubtful.

Of the countries bordering on the Mirza's route, various pieces of information were collected. Kafiristan seems to be in much the same state as at the beginning of the century, the people being still independent, and apparently not diminished in numbers, though their children are much sought after as slaves. The number taken away cannot therefore be very large. The Siyaposh Kafirs are said to be troublesome on some of the roads.

Mustooch and Chitral evidently have a tolerably easy communication with Badakshan, as the Mir of the latter manages to extract an annual tribute from the chief of Mustooch. The road from Mustooch to Chitral is said to be a good one. The Mirza's work clears up several obscure points as to the route between Chitral and Pamir. The Mirza was unable to go by Kolab towards Kokhan owing to the road being in the hands of the Aliman Khirghiz; this, however, was supposed to be merely

a temporary interruption. Various routes were noted as branching off towards the Karakul Lake and Kokhan. The Mirza did not hear much about Yassin, though several routes to it were pointed out, which explains the general run of the mountains between it and Wakhan, &c.

As to Pamir, it appears to be an elevated tract of country broken by rounded hillocks, which rise but little above the lowest ground. The Mirza thinks the word Pamir is derived from the Turkish word Pa (belongs) and Mir (chief), implying that it belongs to the chief of Badakshan. He says that he never heard the term Bam-i-Dunya applied to it, though he thinks that it may have been used figuratively. Bamian, however, he says, he understands is a corruption of Bam-i-Dunya. Various allusions are made to the Alai Valley or steppe occupied by the Alai Kirghiz, which will assist in defining the valley.

The Kirghiz hordes seem to be very numerous, and still adhere to a nomadic life. Their occupation of Sirikul is probably only temporary, as the Mirza says they detest being tied down to any one place, and are very unwilling to undergo the drudgery of agriculture. Probably when they have consumed all the stores of the exiled people of Sirikul they will abandon it. The men take temporary service with the Kashgar, Kokhan, and Badakshan chiefs, but they are not willing to submit to much discipline, and change from one party to another without the least hesitation. The Kirghiz have large herds of horses, camels, cattle, yaks, sheep, &c.

The Mirza got some information as to the routes to the Russian frontier, which were given to him by various individuals. The height of the hills to the north of Kashgar, towards Artush, &c., does not seem to have impressed him much. Routes were also got towards Aksu, China Proper, &c. Some of these will be given in the Appendix.

Both at Kashgar and Yarkund he heard of the great forest or jungle which begins 3 or 4 marches east of Kashgar and north-east of Yarkund. The jungle is said to be very extensive and very heavy, so much so that single men are in great danger from wild animals. The animals are probably wolves and leopards, but the men questioned by Mirza declared that tigers were numerous, and the description give of them was unmistakeable. Tigers, I understand, have been seen in other parts of Central Asia, so it is perhaps possible.*

The most able man in the Atalik Ghazi's service is probably

* The tiger (real and royal) is abundant even in parts of the Amur Valley (see 'Journal of the Royal Geographical Society,' vol. xxviii. pp. 420, 424, 441); in the 'Delta of the Jaxartes' (*ib.* xxiii. pp. 95, 97); and exists, it is said, also in Mazanderan, south of the Caspian.—H. YULE.

Mohammed Yunas (Jonas), the Governor of Yarkund. He is better educated than any of the others; and is, indeed, the only man upon whom the Atalik implicitly relies. His education may easily be better than that of any other, for the Mirza says that there is no one about the Atalik that can even keep accounts, the government of the country dispensing with accounts altogether.

The Jemadar, Nubbi Buksh, is a remarkable man, but the Atalik does not entirely rely upon him. He is, I believe, the same man that Abdul Majeed saw at Kokhan, who was known there as the Lahore Jemadar, and was much thought of, holding a large command in the Kokhan service. This man's history is curious. He started in life as an ordinary gunner in the Sikh service, and after the defeat and breaking-up of the Khalsa Army, his fortunes seem to have fallen to a very low ebb. He at last got service in the Peshawur Magazine as a classie, probably on 5 or 6 rupees per mensem. In 1855, on the Mirza's recommendation, he went to Kokhan, and from that time his rise appears to have been very rapid, as in 1861 Abdul Majeed found him in high command at Kokhan. The Jemadar must be an able man, otherwise he would not have succeeded in holding his own so long. He appears to have been very ungrateful to the Mirza, and was evidently much annoyed at his arrival; this, as far as I can gather, was, in a great measure, owing to his thinking that the Mirza would tell everybody as to his low origin.

There were several Hindustanis, and a good many Afghans, who seem to be held in considerable repute as soldiers. These probably include a few of the Mutineers of 1857, but I should doubt there being many of the same stamp as the Jemadar among the Hindustanis. The Mirza did not think that any others of the Atalik's officials were in any way remarkable. The Atalik appeared to be very self-reliant, acting almost always on his own judgment, and seldom consulting any one but the Governor of Yarkund.

We have been told that the people of Yarkund are well educated, but it is only in a very restricted sense that they can be considered to be so. The Moolahs apparently only teach the boys to learn to read and repeat from books by heart; the Mirza says they none of them understand beyond a few words of the Persian or Arabic in which the few books read by them are written. They repeat like parrots the Koran, &c., without understanding any of it. Figures and accounts are utterly unknown among them, the Atalik's accountant having to count by means of beads.

The Mirza noted the size of the rivers between Kashgar and the Karakoram. The Yarkund or Boi River appears to be the

largest, and evidently drains a great area, and it is a puzzle to think what can become of its great body of water. Flowing rapidly past Yarkund, which is only about 4000 feet above the sea, it must very soon get pretty close to the level of the sea, and there is evidently no chance of its getting out of Asia into the sea. It would be a great thing to get this question solved satisfactorily, and a further attempt will be made to do so.

That the country to the east is very dry seems to be established by the constantly hazy atmosphere. This haze was noticed by Mr. Johnson. It increases with a strong east wind to such an extent as to make it dark at midday. A country subject to such a perpetual fall of dust is a curious fact, and certainly points to a large dry desert tract.

The expulsion of the Chinese seems to have put an end to all traffic with China Proper, and the Atalik's quarrel with the Kokhan Government seems to have checked the trade with Russia; consequently, it would appear that there is at present a better chance for the introduction of British goods and Indian tea than there has ever been before.

The Mirza's Route Survey extends from Sukkur to Khelat, from thence to Candahar and Caubul, a distance of about 950 miles; but as this is not new ground, and Route Surveys of it were, I believe, made formerly, it is not given in detail here.

From Caubul to Punja and Wakhan, and thence to Kashgar and Yarkund, the length of his Route Survey is 1042 miles. This portion is tested by 48 latitude observations at fourteen places. About 350 miles of it is entirely new ground, and consequently forms the most valuable portion. In addition the Mirza did 187 miles from Yarkund to Shahdula (Suget)—the total Route Survey being 2179 miles. The height of 28 points have been determined by boiling-point observations between Caubul and Kashgar, giving a good general idea of the comparative height of the mountains and country traversed.

The new portion of his Route Survey between Punja and Kashgar, Yarkund, &c., accounts approximately for the geography of about 18,000 square miles of hitherto totally unexplored country, and the portion between Caubul and Punja clears up a number of obscure points in the travels of Wood, Abdul Majeed, and other travellers.

Considering that the Mirza entered Afghanistan when it was in utter confusion, that he was consequently much delayed in carrying out his instructions, that he made his journey from Badakshan to Kashgar in mid-winter over the highest mountains in the world, it is highly creditable to the Mirza that he has done so well. The credit is greater as Kashgar could hardly be considered in a settled state, Sirikul, the first district of Kashgar

met with, having only been annexed within a few days of the Mirza's arrival, he having actually met the Ex-Ruler of Sirikul to the west of the Pamir flying from the Atalik's troops. The discretion of the Mirza seems to be established by the fact of his having made his way through such difficult countries when in such a disturbed state. As the Mirza has in such a large measure carried out the instructions given to him, I am glad to be able to bear testimony to his good service.

Details of "The Mirza's" Route, drawn up from the original Journals, &c., by Major T. G. Montgomerie, R.E.

Travelling in disguise, the Mirza took the well-known road from Caubul to Bamian, crossing the Pugman mountains by the Gardan-i-diwar, or Unai Pass, and the Hindoo-Koosh Range by the Hajiguk Pass, 12,200 feet above the sea. Though with an ordinary Kafila, he was very nearly being sent back to Caubul, but the frontier guards were eventually passed with the assistance of a few presents. He found the Helmund River to be about 40 yards wide, and flowing easily at the point he crossed.

From Bamián the Mirza made his way to Khulm-Tashkurgan. The Kafila caught sight of some portion of Azim Khan's troops, but managed to keep out of their way; but farther on they fell into the hands of robbers, who wounded two Hindoos and carried off a considerable amount of goods and animals, apparently with the connivance of the commandant of the fort near which the Kafila had halted for the night. The country passed through was very fertile. The inhabitants own large herds of horses and cattle, flocks of sheep, &c.: every village boasts of a well-stocked orchard.

The Mirza was very glad to arrive safe at Khulm, as he was greatly afraid that if he had fallen into the hands of Azim Khan's troops he might have suffered as a supposed friend of Amir Sher Ali. The extent of the ruins of old Khulm seem to have struck the Mirza very much. The Khulm bazaar was filled with the wildest reports as to the Afghans, and the progress of the Russians. The river Oxus is said to be visible from the top of the Khulm fort, called Tashkurgan, the river being about 20 miles to the north.

The inhabitants of the country between Caubul and Khulm are mostly Shiá Mohammedans, looking to Agar Khan of Bombay as their spiritual guide; they are a very lawless race, and much addicted to highway robbery. Slavery is common in that country and in the whole of the Hazara territory. Agar Khan is said to be a pensioner of the British Government: he is a Persian. His influence is said to be very great between Caubul

and Khulm, as also in Badakshan, Wākhān, Chitrál, Kunjūt, Kāshgār and Yarkund. In order to maintain his influence, he sends his agents from time to time to travel through those countries. Tashkurgan (Stone Fort) is about three miles in circumference; it has weak mud walls without any ditch, but is considered quite strong enough to resist any sudden incursion of the Alimān Khirgiz tribe, who sometimes penetrate into the country. The town is regularly built, and is intersected by small canals: the population is composed chiefly of Ozbucks, Tājaks, and Caubulies, all wearing large quilted chogas, turbans, and boots. A great many shops are kept by Hindoos, who appear to have a large share in the trade of Bokhara, Kokhan, Kundūz, and Badakshan. There are regular market days every week.

At Tashkurgan the Mirza fell in with a traveller in Asiatic dress, whom the natives all considered to be a European. The Mirza was inclined to agree with them, judging by the man's complexion, figure, &c., and was very nearly confiding his story to him; but, as the conversation began in Persian, the Mirza was able to judge of the stranger's command of that language; and as the man made use of the guttural letter "ghain" with as much correctness as a native, the Mirza determined not to trust him, knowing that very few Europeans ever succeed in quite mastering the proper sound of that letter. From what he heard afterwards, there was very little doubt but that this individual had been sent to try and find out what the Mirza's business really was.

The Mirza was fortunate enough to hear of a large Kafila that was going to Kundūz, with an escort of about 150 horsemen. The escort seemed to be in great dread of the Alimān Khirgiz, and, according to the Mirza, would have been of very little use in case of a real attack. From Kundūz the Kafila went on to Talakhan, passing Khanabad, which is said to be as healthy as Kundūz is notoriously unhealthy. The ruins around Khanabad showed that it had formerly been a large place. Rostak was the next place of importance, the Kokcha River being crossed on the road to it. This river has a rapid stream, and was crossed by the men on rafts, the baggage animals swimming. A more direct road runs from Talakhan to Faizabad, to the south of the Mirza's route; but he could not follow it, owing to the disturbed state of the country. Whilst at Rostak, the Mirza made inquiries as to the route to Kokhan *viâ* Kolāb and Karatagheen, which he had been directed to follow. His host, to whom he had been recommended, said that the route was quite unsafe, owing to the general disturbance of Turkistan, and more especially to the incursions of the Alimān Lokhai Khirghiz, who had lately revolted against the authority of the

Meer of Kolāb. The Mirza at first doubted the accounts given as they were largely mixed up with wild rumours about the Russians; but, soon after he arrived, a number of brood mares, colts, camels, sheep, &c., which had been taken from the Alimān tribe, were brought in and put up for sale, and so he thought it necessary to wait till better news arrived. In the meantime, a heavy fall of snow occurred, and closed the Kolāb route altogether; and the Mirza had, consequently, to abandon his intention of following it.

On the 10th of December the Mirza left Rostak during a heavy fall of snow. Snow continued to fall, or, at any rate, to cover the ground, all the way to the city of Faizabad, that is, for four marches. This added very much to the difficulties of the Kafila, and their progress was consequently very slow. The Mirza's men began to grumble, and hinted that they would go no farther with him, &c.

Faizabad is the capital of Badakshan; it runs for about a mile along the right bank of the Kokcha River, and is nowhere more than half a mile in breadth; it has no walls, and its inhabitants are chiefly Tājaks and Turks, but they have not got Tartar features. Here the Kokcha River has a rocky bed and a deep rapid stream. It has three sources:—the first from the Hindoo-Koosh Mountains above Zebak; 2nd, from the Jerm Valley; and 3rd, from the small lake of Bhazghiran. The combined stream falls into the river Oxus (the Amoo Daria) about 35 miles west of Rostak, at a place called Dast Tārā Tuppa. The trade in slaves is still very great in and around Faizabad, the serais and houses being full of slave girls, who have mostly been procured from Chitrál; horses and goods are given in exchange for them. The inhabitants are skilful in smelting iron, and they send a number of cast-iron pots, pans, ornamented lamps, &c., to the market.

The Mirza found that, although he had the Meer's permission, his difficulties as to starting were by no means at an end. Throughout his journey various individuals had pretended to be acquainted with him, to know what he was going to do, &c., and at Faizabad he had to quiet one man who threatened to denounce him as an infidel (Kafir) that was spying out the country for the Feringees, &c. This man was evidently in collusion with the Mirza's servants, and he only got rid of him by means of presents. Then again, no regular Kafila was going across the Pamir Steppe, and the Mirza was forced to make an arrangement with one Abdul Wahab, the son of a Kafila Bashi, or caravan leader.

After a great deal of delay and anxiety the Mirza succeeded in starting off his six servants with Abdul Wahab, who supplied

six more men, including guides, making a total of twelve men. The party started in a snow-storm on the 24th of December, 1868, and followed the right bank of the Kokcha River. The road was very bad, and mostly unfit for riding; but the country round about was very well cultivated and exceedingly fertile. After five marches they reached the small village of Zebak, from whence there is a road to Chitrál. This route is said to be dangerous on account of the inroads of Siyaposh Kafirs; but still a considerable traffic is carried on by this route between Badakshan and Chitrál. The Mirza heard a great many stories about the Siyaposh and other Kafir tribes, agreeing generally with the former accounts given of these strange people, who have succeeded in maintaining their independence in spite of their warlike neighbours in Afghanistan, &c. Though the children of the Siaposh Kafirs are in great demand as slaves, and many are carried off by force, whilst others are sold voluntarily, still the number of these people does not seem to have diminished, and it must be concluded that the percentage carried off is not very great. At Zebak the Mirza parted with his guides, as he found they were constantly trying to frighten his men with stories as to the dangers and difficulties of the road. Abdul Wahab, who had been made Kafila Bashi, said he could get on quite well with his own men, and the Mirza left Zebak on the 1st January, 1869.

After crossing a pass, and subsequently a river coming from the Chitrál direction, he reached Ishkashm Fort, on the Punja or Upper Oxus River. Ishkashm may be considered to be the beginning of the Wākhān (or Wākāh) Valley. The country round about is very fertile, and crowded with villages.

From Ishkashm to Punja the road was but a badly-defined path, running up and down the intervening ridges—a route difficult in every way. Several villages were, however, met with; and the party got over it without much difficulty, though suffering a good deal from the cold. The Upper Oxus River was frozen so hard that it could be crossed at any point. The river is said to be in this state from December to March, and during the rest of the year it is dangerous to ford. This latter circumstance is undoubtedly one of the main reasons on account of which the winter is often chosen by merchants for crossing from Badakshan to Kashgar, and *vice versâ*; the other cause, and possibly a more potent one, being that the snow and cold induces the Kirghiz hordes to remove their cattle and sheep to a lower ground, and there is, consequently, less chance of a Kafila being plundered.

On his route to Punja, the Mirza met Alif Beg, the ex-ruler of Sirikul, who had just been driven out of his country by the

forces of the Atalik Ghāzi of Kashgar. Alif Beg had with him about fifty of his most trustworthy servants and slaves. He himself was well clothed in furs and mounted on a capital horse. He appeared to be much dejected by his misfortunes.

On his arrival at the Punja Fort, the Mirza was taken before the son of the Meer of Wākhān, and, on handing him the letter of the Meer of Badakshan, accompanied by a few presents, the Mirza was made welcome, and a promise was given as to assisting him across the Pamir Steppe.

Though the Meer of Punja promised to assist the party across the Steppe, and gave the necessary orders for twenty days' provisions and a guide to show the roads, it was no easy matter to make a start.

The Fort of Punja is considered to be a place of importance. It stands on a rising ground on the left bank of the Punja (or Upper Oxus) River. It is by no means a strong place, and has only a garrison of about 200 men under Meer Futteh Ali Shah, who is the hereditary chief of Wākhān. His revenue is derived partly from land-tax and customs duties, but mostly from a tax on the slave trade, and on actual slave dealing on his own account.

Having completed his preparations the Mirza left Punja on the 8th of January, 1869, and marched on to Patur, the last village of the Sarhad Wākhān or Wākhā Valley. At Patur it is necessary to purchase supplies for the onward route, not a thing being procurable for the next eight marches, whether the Kashgar or the Kokhan route is taken; any neglect as to a proper supply of provisions is likely to be fatal. The road to Patur was a bad one, running through a very narrow defile crossing the frozen Oxus several times during each day's march. In summer this route is said to be impassable. As far as Patur, for 42 miles from Punja, the country, though not very fertile as to crops, is well peopled, and there is no difficulty about good halting-places near villages. The extreme cold was the only hardship.

The Sarhad Wākhān Valley is bounded on the north and south by high ranges of hills, and up as far as Patur the lower slopes were still covered with flocks and herds.

Twenty miles beyond Patur, near Lunghar, the high hills gradually close in, and soon leave a very narrow gap for the passage of the river; farther on, the high northern hills merge into the comparatively low hills or knolls of the Pamir Steppe. The wealth of the Wākhān Valley mostly lies in live stock—in sheep, cows, goats, ponies, and yaks. The wool from these animals is worked up partly for domestic use, but mostly for export, being exchanged for other goods. The people all wear

thick woollen chogas and trousers, the cold being intense. Their houses are built of stone and mud with a flat roof. Each house has a large stove, or oven, as the Mirza calls it, in one corner, in order to keep it warm, and this it does thoroughly. The houses are generally built touching one another.

The inhabitants of Wākhān are generally Shiá Mohammedans, looking to Agar Khan of Bombay as their spiritual guide. They are said to pay him annually one-tenth of their income. The Mirza says that they complain very much of their own chief's oppression.

Everything being ready, the party resumed its journey on the 2nd of January, 1869. Starting during a heavy snow-storm, they trudged along the Wākhān Valley. The wind was so piercing, even after the snow stopped, that the men had frequently to get on the lee side of their horses, so as to keep it off a little. For the first three marches, the path ran between a number of villages; the lower part of the river banks being covered with a dense growth of stunted willows, as the Mirza calls them, most probably the Myricaria. At the fourth halting-place, a road strikes off to Chitrál by Mustūch (or Mustuj).

Mustūch is said to be a valley draining into the Chitrál or Koonur River, the road to it from Wākhān is said to run for the most part through well-peopled mountains. The route is a short one, being about 15 marches to Chitrál, and, though much snow falls on the pass, the traffic along the route is considerable. Mustūch lies to the south of Wākhān; it is nominally independent, but its chief has to send an annual tribute of slaves to Badakshan, a fact which shows that the communication between the two countries is tolerably good. At this same halting-place a more direct road leads over the mountains to Lunghar by what is called the Marpech, or zigzag road.

The Mirza avoided the Marpech Road, as it was pronounced to be very difficult and dangerous during the winter, though it is used in the summer when the road along the river is impassable owing to the floods. The Mirza pushed farther on, up the branch of the Oxus, for four miles. The path was either on the frozen river or on its banks, passing through a very narrow ravine walled in on either side by stupendous and all but inaccessible mountains. These mountains were very imposing, being clad with snow almost down to the river, and leaving hardly 10 yards of level ground on either side. These mountains are not even fit for grazing in the summer; they are only noted for producing a breed of hawks or falcons which the hardy Wākhānis manage to catch among the cliffs. These hawks are much esteemed by the chiefs of Badakshan, Bokhara, &c. They are celebrated for

their swiftness, and known by their white colour. The Mirza saw a number of them on the hands of Shandar Shah's retainers the night he visited him at Faizabad.

Seven miles beyond the second Patur the party halted and were forced to sleep on the snow. Fires were made with wood from the low jungle, but a fall of snow soon put them out, and the party consequently spent a very miserable night.

The real difficulties of marching across the Pamir Steppe may be said to commence on the fourth day beyond Punja; the marches are long, and there is no shelter of any kind to be got except the dry stone walls, which previous travellers have run up in order to keep off the piercing wind. On the sixth evening the party arrived at the halting-place called Lunghar, from whence a road strikes off to the Kunjūt or Hunza territory, which lies to the south-east. Lunghar is considered to be the beginning of the Pamir Steppe; the halting-place has the usual dry stone walls, but they unfortunately had been taken possession of by the camp of an agent or Vakeel of Shandar Shah, who was going on some business to Kunjūt. Seeing that the only shelter available was occupied, the Mirza only stopped a few hours at Lunghar to collect fuel for the forward march. Having laden their ponies heavily, they started on again, but were not able to make much progress before evening; they halted near an isolated rock which afforded a little shelter from the wind. The whole party, on arrival, suffered a good deal from "Dum," as the Mirza calls it, *i.e.* shortness of breath, &c., the usual effect at great altitudes. The natives generally consider this to be caused by a noxious wind: some of the men became nearly insensible, but soon got over it when they had eaten a little dried fruit and sugar, which the Mirza served out as soon as he saw the state of affairs. The night spent at this sixth halting-place was a miserable one, owing to a fall of snow, and in the morning the men literally rose out of a bed of snow. The great cold had made both the men and ponies very sluggish, and the horses were several times affected by shortness of breath, the Wākhānis however soon relieved them by bleeding at the nose. The next march brought the party to the ruins of what had formerly been Khirghiz huts, which had been abandoned in consequence of incursions made by Kunjūti robbers. From this point there is a good road to Gilgit and Kunjūt. The night at this halting-place was, if anything, more trying than the last. The next morning they started early, and, relying on Abdul Wahab's two young men, they trudged along for nine miles, and were then suddenly brought to a stand-still, owing to their having lost the track which had been obliterated by the fresh snow.

The mountains from Lunghar had sloped off into rounded hillocks, and generally became so open that the travellers were not at all certain as to the route they ought to take. The party now found themselves in an open valley, some four or five miles wide; in it the Mirza made out a small frozen lake, which he estimated to be about two or three miles in length, but owing to the snow it was of course difficult to decide exactly as to where the lake ceased and the land began; a frozen stream issued from the western end, being in fact one of the sources of the Punja branch of the Oxus. The small valley was bounded on the north and south by craggy hills, rising up suddenly from the level ground. These hills are the summer haunts of both the Kirghiz and the Kunjūti robbers, who have temporary huts concealed in various places. It was a great trial to the party to be in doubt about their road in such weather, and in such a desolate place; the men scattered to search for the track, but the fresh snow made it a difficult task. The men's boots, made of thin spongy leather, had sucked up the moisture, and then had frozen, thus making all walking about very trying. The day advanced without their finding the path, and the men were getting disheartened, when Abdul Wahab, who had been dubbed Kafila Bashi, said that if the Mirza and his people would sit still and rest, he would make one more try with the guide and his assistant. Though rather apprehensive, the Mirza thought their only chance was to trust to them, so he and his servants remained behind. The men were away for a long time, and the Mirza thought that his party had been left to their fate; his anxiety lasted till late in the evening, when the Kafila Bashi, much to his relief, came back with the cheering intelligence that he had found traces of the path running along the north margin of the lake. He directed the party accordingly, and they went on two miles farther, and there halted for the night. The Mirza's men had by this time got rather mutinous, and began to murmur when told to light a fire and make the usual preparations: one of them became so impertinent, that the Mirza had to use his stick, a process which fortunately soon brought the others to reason. By the time it got dark a large fire was lighted, and the men were just beginning to get a little warmed, when they heard a wild yell in the direction of the lake, making sure that it must come from a band of robbers, who, though generally absent from the Pamir in the winter, do sometimes visit it even at that time. The party prepared for the worst, putting out their fire at once, and then shifting their camping-place into a neighbouring hollow, whilst the men shouldered their matchlocks in antici-

pation of an attack. After waiting for a short time two men were sent off to try and make out the cause of the alarm; they soon returned with the reassuring news that it was only some of the mounted men of the Badakshan Vakil, who were passing on towards Kunjūt. Though much relieved, it was too late to think of lighting another fire, and the men had to lie down in the snow, passing another wretched night. The party marched on again the next morning, as soon as they could see. For about three miles the track appeared to run along a frozen stream that issued from the east side of the lake, and to flow in an easterly direction; owing to the snow, the Mirza is not quite certain of this, though positive that there was at any rate no perceptible rise to the east of the lake. Daylight enabling the Mirza to look about him, he saw that he had at last reached the crest of the Pamir table-land, or at any rate of that portion called Pamir Khurd (little), which is the name of this part of Pamir. The guides said the name of the lake was Pamir-Kul, sometimes called Barkūt Yassin, after the halting-place near the lake. The mountains close at hand were comparatively not very high, but farther to the north higher peaks were visible, as also to the south in the direction of Yassin and Kunjūt, but the path itself passed out between endless hillocks, and at times there was literally nothing to guide the eye as to which line to take.

The Mirza was now on the backbone or watershed of Asia, the streams to the west flowing into the Sea of Aral, and those to the east into the Yarkund River, and finally into that remarkable depression in the centre of Asia, called Gobi or Lob Nor. He was now at an elevation of about 13,300 feet above the sea. The scene, according to his account, was the most desolate that he ever saw, not a sign of man, beast, or bird, the whole country being covered with a mantle of snow. Though the Mirza and his men were all well supplied with warm clothing—their bodies being encased in woollen chogas, and sheepskin posteens or coats, their heads in fur caps, and their feet in two pairs of long woollen stockings, and their boots filled with wool—they nevertheless felt the cold very much. The Mirza, indeed, says that the intenseness of the cold was extreme whenever the wind blew, and that they then felt as if they were going to lose their extremities, the glare from the snow was very trying to the eyes, all suffering from snow blindness; their breath froze on their moustaches, and every one moreover had to walk in order to keep some warmth in the body. The ponies were in a wretched state; for the last few days the poor beasts had to go without water, and to quench their thirst by licking the snow.

After a most toilsome march of about twenty miles, the Kafila Bashi chose a halting-place near a frozen pool, hoping to get water out of it both for the men and the ponies, but when a hole was broken in the ice the ponies could not be induced to drink at it, and they had to take to the snow again. Soon after they halted, a furious storm of wind set in, and prevented the party from lighting their usual fire, and they could not even make their tea or cook their food, and consequently spent another very wretched night. The Mirza, with his head on his saddle, was just getting off to sleep when he was roused by the two guides from Punja, who came to ask leave to return, and to beg for a present. The Mirza remonstrated against their untimely demand, but they said they could be of no farther use, as they were now beyond the limits of Wākhān, and they could neither act as guides nor guard. After consulting the Kafila Bashi the Mirza paid the men up and let them go, as the Kafila Bashi said he now had no doubt as to the onward route.

The next morning the party followed the Kafila Bashi down the stream, which was now of some size, and clearly flowing eastward into Turkistan; they then ascended to the crest of a low spur, from which they had a good view over the great expanse of the Pamir Steppe, which appeared to be a sea of low rounded hills, one behind the other, but nowhere rising to any great height above the more level ground. Descending from this commanding point, called Aktāsh, or white stone, they encamped near the stream. This last march had been a great improvement on the former one, the snow had retired farther and farther from the track, and they saw signs of animal life in the shape of a herd of some kind of deer which crossed the path: these deer and other game are said to be very numerous in summer. The next day the party again followed down the stream, which was now hemmed in by cliffs on either side, they encamped in a low willow (Myricaria) jungle, and were able to get both wood and grass, and to make themselves and their ponies tolerably comfortable again. The next day, after marching three miles, they caught sight of the fertile valley of Sirikul, and pushing on were soon under the walls of the Tash-kurgān fort, having spent twelve miserable days between it and Punja.

The party pulled up near a deserted house; they had hardly settled themselves when a number of the Atalik Ghazi's Kirghiz soldiers came and joined them, with a view to find out who the Mirza was. When told that he was a merchant going to Kash-gar they evidently did not believe the story, and soon afterwards went away.

Late in the evening the Mirza was summoned by the Governor of Sirikul, and he accordingly went with the Kafila Bashi to the fort. He found the ramparts and bastions all in ruins, and after tumbling about in a rugged narrow passage, he was ushered into a very small dark room. Here he had to wait for some time, in no little apprehension as to what was to be the result of this visit. At last the Governor came in with lights, and the Mirza found himself in the presence of a hale man of about 60. After the usual compliments, and the discussion of tea with very hard wheat-flour cakes, the Governor proceeded to ask a few questions; and, having heard the Mirza's story, he said he would like to have all the Mirza's Khurjīns, or packages of merchandise, opened in his presence, so that he might see what the nature of his goods was. The Mirza was greatly alarmed at this request, lest his concealed instruments should be found out in the search. He had fortunately brought some presents with him to the fort, and he at once proceeded to offer them to the Governor, saying that they were specimens of his goods for his acceptance, and that he hoped he would not have the whole of his packages opened out, as he wished to dispose of their contents in Kashgar, where he was taking some things, for his friend Nubbi Buksh, a Jemadar in the Atalik's service. The presents, and the fact that Nubbi Buksh was in great favour with the Atalik for his military services, made the Governor decide to forego a search; after consideration, the Governor, who is a brother of the Atalik, said that he would allow the Mirza to go on to Kashgar under the escort of a Kirghiz chief called Abdul Rahman; but, in spite of all remonstrances, he would not allow the Mirza to go by himself, still having suspicions as to his real business. With this order as to escort, and the return present of a poor choga, the Governor dismissed the Mirza, who went back to his quarters in great anxiety; for, though his assertion as to the Jemadar Nubbi Buksh having been his friend was true, he by no means felt certain that the man would stand by him, though he was under some obligations to the Mirza.

Sirikul is a valley bounded on the north by the Chichik-Dawan mountains, on the east by the rugged chain called Kāndār, on the south and west by the last spurs of the Pamir mountains. The level ground runs from west to east for 30 or 40 miles, with a breadth of 12 to 18 miles. In the centre stands the old fort of Tashkurgān, a celebrated place, now in ruins, said to have been built by Afrasiab, the conqueror of Persia, as a safe place to deposit his treasure, which is still supposed to be buried within the limits of the fort. The fort formed an oblong, about one mile in length by a quarter of a mile in breadth. The towers and ramparts of rough stone, were all in a ruined state, and the

houses inside were mostly unroofed. Tashkurgān commands the roads from Badakshan and Chitrál to Kokhān, Yarkund, and Kashgar, and is still considered a place of importance, the more especially as it gives a control over one of the chief outlets used by the robber hordes of Kunjūt, when they issue from their narrow glens.

The valley is watered by the Sirikul River, the main branch of which is said to come from the direction of the Karakul Lake, or from the lake itself. It is joined by the stream on which Tashkurgān stands, about five miles to the north of the fort, and some 30 miles farther down by the Kunjūt River, at a place called Charsutoon, and a little farther on by the river which drains the northern face of the Karakoram mountains; the combined stream forming the great Yarkund River.

Sirikul, when the Mirza entered it, had been deserted by the greater part of its native population. The hereditary ruler of the country, Alif Beg, whom the Mirza met near Punja flying to Badakshan, had left as the Atalik Ghazi's troops began to take possession: the Atalik Ghazi had directed all who were attached to Alif Beg's rule to be removed to Kashgar and Yarkund, and this included nearly every inhabitant; their place has been supplied by Kirghiz, who seemed to like the change. The former inhabitants were of the Tāj race, a tall, strong-built set, with good features and fair complexions.

The valley is elevated, Tashkurgān being 11,000 feet above the sea. It produces wheat, Indian corn, &c., which are said to grow well. The whole valley is studded with small square forts, now held by the people of the Atalik Ghazi, and it is well irrigated from its own rivers.

On the 27th January, 1869, the Mirza resumed his march towards Kashgar. He had hardly roused himself when a mounted Kirghiz Sowar rode up and desired him to pack up quickly, in order to follow the Kirghiz chief Abdul Rahman, who had started two hours earlier. After giving the necessary orders, the Mirza paid up the Kafila Bashi, Abdul Wahab, who had carried him safely over the trying Pamir Steppe, and, finally adding a handsome present, in addition to the stipulated pay, the Mirza took leave of him. This Abdul Wahab was a Tāj of (Khulm) Badakshan, though his home for the time being was in Yarkund. The Mirza found him very reliable. Having finished his packing, the Mirza and his men followed the Kirghiz Sowar with anything but pleasant thoughts. Marching northwards for two miles they came to a deserted fort, inside which the houses were filled with every sort of grain, without a single man to look after it. The moment he got there the Kirghiz dismounted and proceeded to help himself, and recommended the Mirza's men to do the same,

as they would get no grain from the Kirghiz encampments during the onward march. The men, consequently, put a supply on their horses, and then went on again, following the Kirghiz. At five miles from Tashkurgān, the path crossed the main branch of the Sirikul River, flowing from the west. Though fifty paces wide the stream was frozen hard. Up stream the flat part of the valley appeared to be very narrow, while to the east it was broad and open, evidently very fertile and extending for a long way down the stream.

After crossing the main stream on the ice, the party followed its bank for about five miles more, the road running through swampy ground. Five miles farther on they passed a deserted Kirghiz village, the houses of which had all dome-shaped roofs. Near this place the Kirghiz chief Abdul Rahman had taken shelter in the tent of one of his horde. The tent was of the usual Kirghiz kind, called Kappa, made with a portable wooden frame covered with felts, a comfortable enough protection in the winter, but not well adapted for resisting rain, which it lets in at every angle.

On reaching the door of the tent, the Mirza was met by Abdul Rahman, and then was taken in and seated alongside of him, the people inside all rising as they went in; after exchanging a few civilities, food was brought in, and the Mirza was asked to share it. At first he was very reluctant to do so. It consisted of a sheep boiled whole, which was laid on a dirty cloth and then hacked into pieces with knives and served out on wooden plates, with a share of the broth to each. Hunger, however, soon conquered the Mirza's scruples, when he reflected that he should get no better food for the next ten days, and he had nothing for it but to eat what was before him.

Abdul Rahman was of pure Kirghiz breed, a square, strong-built man, with a round head and small blue eyes, without eyebrows, broad flat nostrils, and a little stunted hair for a moustache above a bare projecting chin. Fortunately, he was good-natured and anxious to be as kind to the Mirza as he could; he was the chief of a large horde, and said to be able to muster about 3000 armed horsemen. He and his horde owned great numbers of sheep, goats, yaks, horses, and double-humped camels, which are grazed in different places according to the season, going wherever the grass is best. The Kirghiz men and women both wear loose woollen chogas and trousers, with high, thin, leather boots. The men are ugly, the women somewhat better-looking. They are Mahommedans, but not rigid observers of that religion. Snow fell all night, but the tent was so comfortable that the Mirza did not wake till the call for morning prayer was given. He then found the Kirghiz men all sitting round the fire, sipping gruel

made with flour. They offered him a share, but he was not hungry enough to try it. The chief rode on ahead and left a man to guide the Mirza.

This man was rather a clog on the Mirza's observations. However, he managed to take what was required at odd times, when the man was ahead and not looking. Soon after starting they commenced the ascent of the formidable Chichik-Dawan Pass. After toiling for 11 miles up the snowy slope, by a path which was only fit for goats, they at last gained the summit. The Kirghiz had beaten down a path in the snow; yet two of the chief's horses fell down and were killed. The Mirza's ponies were fortunately very strong, and managed to scramble up, though much tried by their struggles. At the top they found a sort of table-land, lying to the north. The elevation was very great, and everyone had difficulty in breathing, which the Mirza and his men tried to remedy by munching sugar-candy and dried fruit, a cure which had but little effect beyond keeping the men in good humour. The scene was a most desolate one, if possible, even worse than that of the Pamir Steppe. Some high peaks were visible to the north-west. After walking about a mile the path began to descend again so rapidly that every one had to slide over the snow on their hands and knees, &c: the ponies got down with very great difficulty. After struggling for about 20 miles, they found themselves at the bottom of the slope; it was then getting dark, and they were much disappointed to find that the chief had gone 7 miles farther to a Kirghiz encampment. As there was no shelter at hand, there was nothing for it but to trudge on through the snow, which now began to stick to the feet, both of men and horses, making progress very difficult. After getting over about three miles they were startled by a man suddenly appearing. Fortunately, it was only a guide left by the chief. At the same time one of the Mirza's ponies kicked off its load and ran away, and the party had to divide its load, and carry most of the things on their own backs. It was not till near midnight when they reached the encampment. The chief welcomed the Mirza, and regretted that the march had been so trying, and then gave the party some tea and gruel,—the only food that could be got at that hour. Several of the men missed the road, and spent the night in the snow; fortunately, they all turned up in the morning, and the lost horse was found in the encampment.

The Mirza's men had got very mutinous, and he had the greatest difficulty in keeping them quiet. The encampment boasted of few tents, the place not being a very pleasant one,—the only fuel, moreover, being green twigs from small bushes, which produced a pungent smoke that made the Mirza's eyes

ache without warming him. After a miserably cold night the party marched on down the steep ravine, and at the end of five miles were delighted to find themselves in a low jungle, where the chief decided to call a halt so that the half-frozen men and horses might recover themselves after their fatigue and exposure—the chief at the same time having an eye to collect his tribute from the Kirghiz who were pitched round about. The party had not yet got away from the snow which covered the whole valley except on a few places near the ravine. Spite of the snow, the slopes were dotted with numerous Kirghiz tents, the chief attraction evidently being the firewood and the grass, which was got pretty easily, as the snow was not deep.

The Kirghiz inhabitants soon brought in their tribute, which they paid chiefly in sheep, camels, horses, butter, and coarse woollen cloth, adding a couple of slaves whom they had got in exchange for horses. These slaves turned out to be men of the Kashmir Maharaja's army, who had been captured in Yassin or Gilgit. They appealed to the Mirza, bemoaning their fate and saying they saw no chance of escape. The Mirza could do nothing, much as he pitied them; and, indeed, he could not help thinking that he might meet with a similar fate.

As soon as the chief had collected his tribute, the party marched on again, the road and country being very much as on the previous day. At the seventh mile, the stream which they had followed from the Chichik-Dawan diverged to the south to join the Yarkund River. The road turning to the north led up by a steep slope, then across tolerably level ground, and then descending again, passing a domed house in ruins, called Chahul-sutoon, supposed to be on the boundary between Sirikul and Yarkund. Farther on there was a still steeper ascent to a ridge covered with huge masses of rock, then another descent, which finally, after trudging for 23 miles, brought them in sight of a beautiful valley, called "Keen," or the Bride, from its general fertility, being a wonderful contrast to the desolate barren track the party had just traversed. The sight of this valley, with its easy slopes and stream of flowing water, quite put the Mirza and his men into good spirits; and they looked forward to their chances at Kashgar with less gloomy forebodings than they did whilst in a half-frozen state. The country looked altogether more civilised, and the Kirghiz families passed were generally busy spinning wool or weaving.

After leaving this valley the road turned to the north-east, over a stony pass enclosed by great cliffs, then down the ravine coming from the valley, crossing and recrossing the stream repeatedly, until the men and horses were fairly tired out, their

limbs being stiff with the cold and hard exercise they had been undergoing.

Whilst struggling through this ravine they passed a crowd of starving men, women, and children, who had been brought as captives from Sirikul without either provisions or warm clothing. They were grubbing about to get something edible in the shape of roots and herbs. They were the adherents of Alif Beg, the ex-ruler of Sirikul, who, they said, had poisoned his mother and wives lest they should fall into the hands of the Atalik Ghazi. The whole formed such a miserable sight that the Mirza gave them as much as he could spare from his small stock of dry fruit and sugar, thinking that, as he was now getting into a civilised region, he might be able to buy more for his party.

The Kirghiz chief pushed on with unceasing energy, changing his horses at any Kirghiz tent where he chose to alight. In this way he always got over his marches in good time; while the Mirza's party, on their tired ponies, were left far behind, with only one Kirghiz, as a guide, in attendance, which, though uncomfortable, allowed the Mirza to take his bearings and make notes—a proceeding which escaped notice except on one occasion, when the attendant Kirghiz rode up and asked the Mirza what he was looking at in his hand—a question which he managed to put off for a time, and thought had been forgotten; but, in the evening, the chief said he would like to know what his man had seen him looking at. The Mirza said it was nothing but a Kibla namā (a compass) that pointed to Mecca. The chief said he would like to see it; and the Mirza got out a real Kibla namā, a poor one, made in Russia, and handed it over to the chief. As soon as it was shown, a dozen of the wild Kirghiz crowded round to look at it, and were astonished to see that it always pointed in the right direction. Though professed Mahommedans, they had never seen one. The chief begged to have it, and the Mirza, as he had several with him, made him a present of it, congratulating himself that he had saved his prismatic compass at so small a cost. The chief was immensely delighted with it, and seemed to be just as ignorant about it as his men.

At 28 miles from Keen, or 98 miles from Sirikul, the party got clear of the rugged country, and, turning more to the east, came upon a fort called Karāwal, at the entrance of the Chichik-Dawan valley. This was a strong place, completely commanding the road, the ramparts being built on the edge of the cliffs in such a way as to appear inaccessible on all sides, except by the eastern and western gates. The fort appeared to be about a mile in circumference, including a number of deserted houses, only a few being occupied by about 200 of the Atalik's troops who seemed to be badly supplied, and had the

credit of plundering every one that was without a pass from the Atalik or his officials.

Soon after passing Karāwul, the hills receded to the west and south, opening out a distant view of the Kashgar and Yarkund territory. The Mirza, following the stream for a time, found himself in a fertile country, all but flat, covered with villages and forts, each embedded in large orchards of fruit trees. Finally, he crossed over the Yangi-Hissar River on the ice near the junction of the stream which their road had led them along; the river was about 100 paces in width, and in the summer could only be crossed by the bridge.

Late in the evening the party entered the town of Yangi-Hissar; the Mirza was taken to a house, and at once presented with a muslin turban and a pair of boots, when he objected to receive them; the chief said it was the custom of the country, being a mark of hospitality. The Mirza was glad to be inside a town again, but, knowing the restless nature of the chief, he felt sure there would be no halt, so he looked about him as much as he could the very day he arrived.

Yangi-Hissar has decayed mud walls, but there are many houses around just outside the walls. The houses are of one storey, with mud walls and flat roofs. It has a large bazaar, wide enough for carts; the shops are full of every kind of goods, and the town seemed to be in every way well supplied. On the west of the town there is a stronghold built by the Chinese, and called the New Fort, and it was said to be garrisoned by 1000 of the Atalik's soldiers (called Sirbazes) with some guns; the Atalik is supposed to keep his treasure there.

The main branch of the Yangi-Hissar River is said to rise to the west. A short route into the Alai Valley, and thence to Kokhān, goes up this river. Saltpetre and iron are found in the neighbouring mountains to the south-west. The people seemed to be well off, mostly engaged in agriculture, but doing a little in the trading way. Donkeys are generally used for carrying loads in preference to horses.

As the Mirza imagined, the Kirghiz chief could not bear the idea of halting in the town; the very next morning he pushed on again, evidently anxious to get rid of the charge of the Mirza, and then to get back to his own barren territory. Starting early on the 2nd February, 1869, the party crossed, after two miles, a frozen stream, 20 paces wide; at 11 miles they forded the River Kosun, 40 paces in width, and at 18 miles forded the large River Jolak, with a bed about 150 paces in width; and, two miles farther on, another, 60 paces wide, putting up for the night near it in the village called Opechan.

The next day (the 3rd February) after crossing two moderate-

sized streams, the Mirza, at 13 miles, crossed the great Tarwarak River, with a bed 150 paces in width, by means of a wooden bridge, entering the Yanga-Shahr, or new town of Kashgar, three miles beyond the bridge, being five miles short of the old town of Kashgar. Between Yangi-Hissar and Kashgar, the country was studded with villages, and every piece of available land was carefully cultivated. Shops were met with on the road every now and then, where travellers could buy refreshments in the shape of ready-made bread, boiled fowls, hot tea, sherbet and sour milk, which were always ready at the smallest shops. Everything was very cheap. Along the road, at intervals of about 4½ miles, the length of one tash (tash meaning stone), a board was fastened to a pole to indicate the distance from Kashgar to Yarkund. Orchards of fruit trees, and groves of mulberries, occupied a large portion of the land, which is generally level, the hills in the distance making but little show, except near Yangi-Hissar, where high mountains were visible to the west and south-west, while to the east nothing in the shape of a hill was visible.

The party reached Yanga-Shahr about midday; it appeared to consist of a large fort with a small town attached; there were not many trees immediately around it, hills were visible to the north, afterwards found to be part of the Artush range. On reaching Yanga-Shahr, the Mirza was at once taken to a small fort, in order to be shown to Nubbi Buksh, the Punjabi Jemadar, the Kashgar officials evidently thinking the Mirza's story as to his being a friend of the Jemadar was false. On seeing the Mirza, the Jemadar put on a look as if he had never seen him before in his life; the Mirza, however, explained so many incidents in Nubbi Buksh's career that he at last reluctantly confessed that the Mirza was an old acquaintance of his. The Mirza was pressing his point farther, but, as the Jemadar evidently did not like it, he changed the conversation, and did his best to convince the Jemadar that he wished to be friendly towards him, and had no intention of dwelling on any awkward incidents in his career. The Jemadar, however, was anything but pleased at being forced to acknowledge that they had been friends, and he insisted that it was nothing mercantile that had brought the Mirza to Kashgar at that time of the year, and he pretended to know what the Mirza's real object was; the Mirza had finally to stop the conversation, and to be satisfied with having got him to admit that he knew him.

The Jemadar soon afterwards rode off to report to the Atalik Ghazi, and before long returned to inquire whether the Mirza had any letter, and the usual presents for the Atalik with him; the Mirza said he had nothing of the kind, and that he was not

a vakil, &c.; but all in vain, the Jemadar said he must show his baggage, and, forthwith, had everything opened out. Having taken whatever he fancied, he then directed the Mirza to take up his abode in a neighbouring house in the same fort, which afforded but miserable quarters, already partly occupied by some Afghans who had been directed to watch the Mirza closely: there the Mirza passed the night in great anxiety, not knowing how the Jemadar would behave. Next morning the Mirza was taken over to the large fort, and introduced into the presence of the Atalik; the Mirza passed a large open building filled with some hundreds of people, who were eating; he was then ushered into a small room, where he found the ruler sitting on a carpet with two or three chiefs around him. The Atalik received the Mirza much more graciously than he expected; welcomed him to Kashgar; asked him a few indifferent questions, and then requested him to go and breakfast with his chiefs in the outer house, where they were all seated round a fire. The Mirza found these officials talking about two English officers who had lately entered the Kashgar territory; they asked the Mirza if he knew them, but he said he did not; they did not speak much, but allowed the Mirza to eat without interruption. The food consisted of baked bread, dried fruits, tea, sugar, milk, eggs, and excellent fresh melons—the latter having been preserved from the previous summer, simply by hanging them up from the roof of a room. The yolk of the eggs was eaten raw by itself, the white being mixed up with sugar-candy as a sweetmeat. There were a number of servants in attendance, who brought in the things, and offered them to every one. As soon as he had breakfasted, the Mirza was taken out to receive a dress of honour, and then taken before the Atalik again, to return thanks. After the audience, the Mirza was directed to live with the Jemadar, who, however, gave him no better quarters than he had at first assigned to him; and the Mirza found that there was nothing for it but to live with the low set of Afghans in the little house. Among these men, he found a Lohāni Afghan, called Mahomed Zamān, who told him he had been a guide to Mr. Johnson, when at Khotan; he said he had been with the "Sahib" some time, and had seen him observing stars, and also putting some instrument into warm water (a boiling thermometer, in fact). This proof of the man's acquaintance with such matters was anything but reassuring to the poor Mirza, who began to think he should never be able to handle his instruments; for, if seen by such a man, it would be impossible to put him off with any story as to Kibla namās, &c., such as answered for the ignorant Kirghiz. For a time, consequently, the Mirza was unable to do anything; but, at last,

a lucky chance took this too knowing Afghan away on duty to Yarkund, and the Mirza was soon afterwards able to take several meridian observations of the sun from inside one of the roofless houses in the fort, but he was unable to take any star observations, as he was too strictly watched during the night and forbidden to go outside. Only on one occasion was the Mirza able to take a night observation, when he went out on some excuse, and took the altitude of the pole star. Having stayed away rather longer than usual, he was cross-questioned, and the Jemadar directed that neither the Mirza nor his men should be allowed out of the sight of the sentry.

During his residence at Kashgar the Mirza was called before the Atalik on several occasions, in order to ask questions as to Hindustan, Badakshan, and Afghanistan, and also to find out who the Mirza was; but the Atalik did not speak much. At other times the Mirza saw him passing towards the Artush Ziyarat, called Khoja Affāk, where he generally went every Friday.

The Mirza describes this remarkable man as being a devout and strict Mahommedan. His name is Mahomed Yakub Beg, a native of the village of Pishkadh, between Tashkend and Kokhan. He is of the middle size, dark complexion, and is now about fifty years of age. His father was a petty farmer or small zemindar, and he himself started in life as a Peshkhidmut, a sort of private upper servant, or one of the body-guards of the Khan of Kokhan. Half a soldier, but bound to give personal attendance to the Khan at table, during dressing, while mounting his horse, &c., his emoluments at that time probably did not amount to more than Rs. 100 a month, paid by the assignment of the revenues of a small village, and by perquisites in the shape of clothes, horses, arms, and so on. From Peshkhidmut he rose to be Dadhkwah, or Governor of Ak-Musjid, a post which he held for about three years, nearly up to the time the Russians occupied that place. He has the credit of having allowed the Russians to settle near the Ak-Musjid fort without the knowledge of the Khan. When this became known to the then Khan, Yakub Beg is said to have run off to Bokhara, the Russians taking the place soon afterwards. Bribery is supposed to be at the bottom of this transaction; but however that may be, he remained away about three years in Bokhara, and was then taken into favour with the new Khan of Kokhan, Mola Alum Khol, who had lately succeeded to the Musnud, and was made one of his Durbar chiefs, and had the revenue of two or three villages assigned to him. He has received no education, can neither read nor write, though his people declare that at the age of forty-five he

learnt his letters sufficiently to read the Koran, which he is said to study every morning. He is very strict as to all rites of the Mahommedan religion, and forbids wine, opium, and smoking. Females are not allowed to go about unveiled, and every one is ordered to pray five times a day.

He is a Tajuk, and his native language is Persian, though he now seldom speaks anything but Turkish. At the time of his return to Kokhan he was in no great favour; but, on the representation of Walli Khan Tora (one of the chief men at Kokhan), the Khan sent him to assist in driving the Chinese out of the Kashgar territory. Whilst Yakub Beg (now styled Atalik) was engaged on this expedition, Walli Khan Tora tried to set up for himself in Kashgar; but owing to the Atalik's intrigues, was forced to fly to the mountains, where he is said to have been murdered by some unknown person: a fitting fate for the scoundrel, who, besides having the unfortunate M. A. Schlagintweit murdered, was noted throughout Turkistan for various other atrocities.

Yakub Beg, however, was successful in driving out the Chinese; but the Khan in the meantime had his own difficulties in Kokhan, and could exercise but little control over the Kashgar expedition. Yakub Beg (Atalik) was consequently very much his own master, and when he finally heard of the Khan's death in action with the Russian troops, he decided to make himself independent of Kokhan. In consequence of this there is great enmity between him and the present ruler of Kokhan.

In spite of numerous difficulties, both with the Kokhanis who accompanied him on his first expedition, and also with the various people of Kashgar, the Kirghiz tribes, &c., Yakub Beg managed to establish his rule over the whole of the Kashgar territory.

When he was first sent against Kashgar with four or five hundred sowars (mounted men) he received the title of Kushbegi from the Khan of Kokhan, and this appellation was continued for some time after he separated from Kokhan; but he has latterly assumed the title of Atalik Ghazi, which he is supposed to derive from the Amir of Bokhara, with whom he is in friendly relations, vakils being exchanged between them.

The Mirza found the Atalik courteous; he appeared to have simple manners; but he has the credit among his people of being very suspicious, and is known to have his spies all over the country. He has a violent temper, and his ordinary expression is a threatening one, insomuch that the people who meet him do not care to look him in the face; nearly every one looks down as he passes. When anything angers him he

becomes exceedingly abusive, and is apt to take summary justice. The Mirza on one occasion saw him try to cut a petitioner down, the man only escaping by getting between some guns.

He and his son are always armed; he takes great precautions to prevent his officers holding general meetings; and he is more especially afraid of being murdered by some of the Kipchak-Kirghiz, a strong horde who opposed his rise to power. Very little talking goes on in his Durbar, the conversation being chiefly confined to answering his questions, the officials all looking down as if they were afraid to look about them; and generally there appeared to the Mirza to be very much less freedom than is usual in a Central Asian Durbar. He is noted for his generosity, dividing the horses, clothes, &c., which he receives as taxes, amongst his adherents. He gives a meal to some three or four thousand people every morning after prayers. The people respect him for being religious, and for what he has done in the way of making roads, bridges, schools, caravanserais, mosques, &c. He encourages the wealthier people to follow his example. He has collected a number of women in his harem, a large proportion being the wives and daughters of the Chinese whom he turned out of the country. He is said not to spend much of his time among these women.

According to the Mirza, the greatest defect of his government is in the revenue-system for the collection of taxes, &c., his territory being divided out amongst his relations or friends. These officials are allowed to take whatever they like; no accounts are kept, and as long as the Atalik is paid his dues he takes no notice. The consequence is a large amount of discontent, which is said to be shown by the greatly increased number who make the pilgrimage to Mecca, hoping that they may be less oppressed when they return as Hajis, that title generally being a safeguard against anything of the kind. Some, however, are said not to return at all, but to emigrate for good to Constantinople, &c. The taxes are paid in produce —officials having to make a yearly present in addition of large silver pieces called yamu (160 Rupees each), and of horses, chogas, &c., according to their rank.

On the whole, the Mirza thinks neither the people nor his officials like him; the latter secretly hate him for his harshness, and more especially for the irregular way in which they are paid. One of his rules against his own countrymen returning to Kokhan is particularly disliked. He is said to be a good soldier, exceedingly vigilant as to every movement either in his own territory or beyond his frontiers.

His army is said to consist of about 20,000 men, with 70 guns of various calibres, mostly small. In emergency it is supposed that he could muster 20,000 men more from among those Kirghiz hordes, with whom he is on good terms. The soldiers consist of Sirbazi, Tafarchi, and Sowars. The Sirbazis are armed with a matchlock and bayonet; uniform of quilted red Russian cloth, with long boots, supplied by the Government twice a year. They are drilled every morning by Afghans and Hindustanis, after the English fashion. The Tafarchis number about 2000; they are armed with very long matchlocks, taking three or four men to work them: they are mostly Chinese who became Mahommedans when the Chinese Government came to an end. The Sowars form a very irregular cavalry. There were about 7000 soldiers in and about Kashgar itself. The guns are all brass, mostly cast by Nogai Turks, who consider themselves subjects of Russia. Some have been cast by men from Turkey (Rum), and others by Hindustanis—those by the two latter being considered the best. The guns are said to work well up to about 1500 yards. Spite of all this show the Mirza does not think the troops are at all reliable, the people generally not having much taste for fighting, and no doubt the Atalik relies mostly on his own Kokhanis.

After the Mirza had been some time in the fort, he was informed by the Atalik that he wished him to see the Shagāwul Dadkhwāh of Yarkund, and he consequently visited the Shagāwul; then a high official was sent to make full inquiries as to who the Mirza was, &c. He had to meet a number of people, when the British and Russian Governments were discussed, as well as those of Afghanistan, Bokhara, &c. The Mirza says he pointed out the great power, resources, &c., of the British, and quoted various points to prove the same; when an Afghan who was present got excited, and denounced the Mirza before the assembly as a Kafir (infidel) that did not give proper respect to the Mahommedan princes. Fortunately the others took the poor Mirza's side, otherwise he would have had a great chance of being stoned; as once the cry of Kafir is raised, these bigoted Mahommedans are apt to act without farther inquiry. The Mirza from that date did his best to avoid all public discussion lest he should get into trouble.

The Mirza contrived to visit the old city of Kashgar thrice, on days when the Atalik was absent at Artush; unfortunately he had not much money to spare, and the man of the guard he bribed to take him there was not quite satisfied, and consequently informed the Jemadar of the Mirza's trips to the city. The Jemadar abused the Mirza roundly, and then reported him

to the Atalik, and expressed his opinion as to the probability of the Mirza having been sent as an artillerist and surveyor, as he was with the Kokhan Vakil in 1855. The Atalik, hearing that the Mirza was an artilleryman, wished to get him to make fine gunpowder and gun-caps for his army, and sent his son-in-law to try and induce the Mirza to teach his people. The Mirza had great difficulty in convincing him that he did not know how; the British, as he understood, always getting such things ready-made from Europe; and it was only by appealing as a guest of the Atalik that he was let off. The Jemadar, however, continued to threaten, and there was no appeasing him till he had got nearly every piece of property out of the Mirza.

Some time afterwards an official was sent with a compass and a pocket sextant, and a request to be shown how to use them. The Mirza had to plead ignorance, thinking it was a trap to find out whether he knew how to handle such things.

Owing to the restraint that was put upon him, the Mirza was unable to visit the Russian frontier himself; but he made friends with a Lohani merchant who had lately arrived from Tashkend by the Narain Valley. This man visited him very often, and gave him information as to the Russian posts, and the following route, viz.:—from Kashgar to Kūrbāshi, three days' march; thence to Chā'lur, three days'; and to Zertash, one day's —all through country infested by wandering Kirghiz, subject to Kashgar; from Zertash to Togia, a Russian fort, two days' march. Togia is said to be garrisoned by 400 sappers. After two marches more, the route crosses the Narain River, over which the Russians have built a bridge, protected by a fort with 500 men. From the Narain, at a distance of ten days' march, is Tāmāk, garrisoned by 100 men, and four mountain guns; thence, ten days' march farther on, to Allay, garrisoned by 2000 men and eight guns; the Russian garrisons increasing rapidly in proportion to the distance from Kashgar, the Lohani probably wishing to impress the Mirza with the wonders he had seen.

The Mirza's long detention and want of funds made his men mutinous again, and he was puzzled to know what to do. He first of all asked to be allowed to return by Badakshan; but the Jemadar opposed this, and said the Mirza might return with the two English gentlemen then in Kashgar, and ended by preventing him from doing either the one or the other. The Mirza had hoped that he might get some assistance from these gentlemen, and perhaps be able to assist them; but he had great difficulty in communicating with them, and the Jemadar so constantly misrepresented his actions, that he was forced to give up the idea. He was much dispirited when these gentlemen left.

Funds were his great difficulty; but he was at last relieved by meeting an Afghan prisoner who had been in the Kashmir Maharaja's service, and who was anxious to send money to his home. He offered to lend the Mirza money, on the condition that it was repaid to his family in Kashmir. Having taken a small loan from this man, the Mirza was eager to be off; and, finding that the Jemadar would in no way assist him, he at last in despair, said he would appeal to the Atalik in person. This alarmed the Jemadar so much that he at once went and asked leave for the Mirza to return to his country. The Atalik sent for the Mirza, and received him graciously, ordering him to be given a dress of honour, and gold dust worth 60 rupees, in order to buy a horse for himself. Permission to return, by the Yarkund route, to Ladak, was given, with a passport, describing him as a Kabuli traveller. This passport bears the Atalik's seal, and the Mirza holds it as a proof that he assumed no official character while in Kashgar territory, as at one time supposed. The Jemadar tried to retain the Mirza's men; but, on a hint to the Atalik, they were also supplied with passports.

The city of Kashgar is built in an angle between two branches of the Kozūl River, which join one another a few miles east of the city. The Kozūl, or Kozūl Yaman, comes from Mosh (a ruined place towards the Tarik mountains); its other branch, the northern one, is called the Toman. The united stream flows eastward, passing, at 40 miles, a small town called Faizabad, and, after receiving the Aksu stream, joins the Yarkund River. During the winter, both branches of the stream are frozen, and the Kashgar people can cross anywhere on the ice. In the summer, they cross by two bridges, lately built or rebuilt by the Atalik, so as to be fit for carts. These carts are drawn by two ponies or mules, and sometimes by three arranged unicorn fashion. The city is built on an easy slope; it is surrounded by a high wall, with towers at about every 50 yards. The wall is a thick one, made of sun-dried bricks, and has three gateways, with large wooden doors, protected by iron plates. The streets are very irregular; the houses are built with sun-dried bricks and flat roofs, and touch one another. Every house has its own fireplace and chimney, where the cooking is carried on inside: the houses are generally kept very neat. The poorest houses have felts and carpets for the floors; in the better houses, benches and beds are used. The bazaars are large, and wide enough to allow the carts to pass one another; the shops are well stocked with native and foreign goods. The city is well supplied with water, both by canals from the river and from springs. There are no buildings worthy of note, the mosques

and schools (madrussa) being only a little higher, and differing in no other way from ordinary houses except in having painted doors. There are eight colleges, eleven caravanserais, and a mosque in every street, where the people are forced to say their prayers five times a day. The streets of the chief bazaars are covered in with rough timber and mats, to keep off the sun in summer and the snow in winter.

The number of families in the city were reckoned at 16,000 in the time of the Chinese; but since their time the numbers have fallen off very much, many people having emigrated. The population is very mixed, the men comprising Turks, Tājuks, Tungānis, Badukshānis, Andijānis, Afghans, Kashmiris, Hindustanis, and a mixed race descended from foreigners and the women of the country. Tartar features and complexion predominate. The people generally are a profligate set, and, though good-humoured, are crafty and inhospitable. They are generally opium eaters, and are much given to dancing or singing, though the Atalik has forbidden everything of the kind. The only musical instrument in use is a sort of harp, like the Hindustani sitara. Both sexes wear the same shaped chogas, long loose quilted cloaks of coarse cotton cloth, over a tight-fitting jacket buttoned at the side; trousers of long cloth and various coloured silk; and a cap lined with inverted lambskin, with a turned-up border, completes the costume in winter. The border of the cap is sometimes made of "sugbao" or "sugābi" (otter) skin from Kashmir or Hindustan, but the skins from Russia are preferred. The crown of the men's caps is generally made of plain Russian broadcloth; the crown of the women's caps is generally of Benares brocade (kinkab), cloth embroidered with gold thread. In the summer these caps, lined with lambskin, are changed for others made of cotton cloth, fitting to the head, the caps well starched so as to preserve their shape. Those worn by the women are of a different shape, the women of the richer classes using Benares brocade, or a cloth embroidered with twisted silver thread got from Russia. Both sexes wear long high-heeled boots—those worn by the women being shod with iron, those of the men having no iron; the leather is generally native, made from goat-skins dyed red or pink, the richer people occasionally using Russia leather. The boots of the women look very gay, being ornamented with red or yellow silk, &c. The women do not wear many ornaments, beyond a few rings and three or four heavy silver or gold buttons of an almond shape worn in the body of their dresses. They are fond of flowers, and wear them in their caps; a few flowers are grown in the courtyards of each house. They do not darken their eyelids with antimony,

but instead paint a dark line so as to join the two eyebrows. They wear two long plaits of false hair, which hang down their backs. They are not seen much in public, as, whenever they go out, they are obliged to wear a large black or white "burkha" —a sort of sack, which covers them from head to foot, a piece of muslin, with eyeholes, being used as a cover for the face. This is a new custom in Kashgar, introduced by the order of the Atalik, which the women particularly dislike.

The men always carry knives, with which they eat meat and fruit: the knives hang from their waists, and a leather pouch, with steel, flint and tinder, always accompanies. Their food and times for eating differ considerably from the customs generally observed amongst Asiatics: they eat three times a day, and drink tea with each meal. The food consists of broth, made with flour, rice, &c., and a dish called "āsh," made with a sort of vermicelli from wheat flour, boiled with fresh vegetables, such as turnips, radishes, Indian corn, &c., seasoned with salt only: this vermicelli seems to have been introduced by the Chinese. Linseed oil is used instead of butter or ghee, which the Mirza found made the food disagreeable both to his palate and nostrils. The tea is boiled, and after being strained is mixed with milk and salt: they drink it hot, with wheat flour cakes. Spices generally are not in favour for meat, though they sometimes use pepper, &c., in their tea. The people are simple Mahommedans, and do not mix up any local superstition with their creed.

Level ground extends to about 40 miles south of Kashgar, 30 miles to the west, and 15 miles to the north, while to the east there are very extensive plains. To the west and north-west there are high mountains connected with the Pamir, which enclose the Alai Tarik and Narain valleys: they appear to be distant.

Kashgar is said to be very healthy in winter: the climate is dry, and so cold that fires are required in every house—rivers, tanks, and canals all freeze, and water is only got from the four springs, which seldom freeze hard. Snow falls very often, but seldom to a greater depth than a foot; it moreover soon melts. The river remains frozen till the end of March, and no snow is seen after that till December or January. In the spring the weather is very stormy, and the wind so strong sometimes as to blow down the Kirghiz tents that are pitched in the neighbourhood. The stormy winds are invariably accompanied by a hazy atmosphere, sometimes to such an extent that lights are required in the middle of the day. This is supposed to arise from an impalpable dust. The Mirza says that during the four months he was in Kashgar he could never see the sun clearly until some

hours after it had risen—it was always more or less obscured by a sort of dust or haze, and only three or four times really clear. The sun always had a sort of pale red colour for three or four hours after it rose.

The soil, though very sandy, is, owing to the large amount of irrigation, very fertile, producing wheat, barley, rice, cotton, Indian corn, peas, carrots, turnips, radishes, linseed, mustard, hemp (bhang), &c. The cultivation of bhang (hemp) is very extensive; an extract from its leaves is made, called "churrus," which is exported in large quantities to India, Western Turkistan, &c. There are numerous gardens and orchards to the north-east: these are irrigated by canals, and produce pomegranates, melons, mulberries, apricots, plums, apples, pears, walnuts, grapes, figs, &c. Fuel and timber are very scarce, everything of the kind having to be brought from a jungle, called Moral Bashi, which lies about three days' march to the east. A donkey load of wood costs about two rupees.

Tea, chintz, long cloth, inferior broadcloth, Benares brocade (kinkab), are plentiful in the bazaars. Goods of Russian manufacture supply the shops generally; they are said to be cheap, and not to be so long on the road as British goods from India.

Since the downfall of the Chinese Government, a considerable amount of jungle leaves and herbs have been used as a substitute for tea.

Coarse gunpowder is manufactured, but the materials are neither well ground nor well mixed. Shells for mortars are cast after a rough fashion: inferior matchlocks are made and some are imported from Russia; but neither are much esteemed. The few arms of British make that come from India are much prized.

At length, after a detention of more than four months, the Mirza was allowed to start for Yarkund on the 7th of June, 1869. His passport having been granted, he was directed to leave at once, and consequently had hardly time to arrange his affairs. Starting the same evening he marched four or five miles, and the next day reached Yangi-Hissar. The country, which on the Mirza's arrival was under snow, was now covered with fresh crops, and the trees were in leaf. The rivers which he had crossed on the ice were swollen with water, and had to be forded, except in the few cases where bridges were available. The water of the rivers was generally clear.

At Yangi-Hissar the Mirza again tried to take star observations, but owing to stormy weather and the dust haze he was not successful. The next day the Mirza marched on to Yarkund. At about a mile east of Yangi-Hissar the road crosses the main

branch of the Yangi-Hissar River by a wooden bridge; at 6 miles passed Lungar (a halting-place); at 8 miles Sughet Bolak, a large village; at 13 miles Karāwal, a military post, and also Kulpan village; at 16 miles Taplāk, a large village; at 22 miles Tumorra, a village; at 26 miles Kodāk, a well; at 27 miles Chumlak village; at 31 miles Kazil, a very large village, with a military guard for the purpose of examining passports: here supplies for men and animals are very plentiful. To the east of Kazil a sandy desert tract, called Samandchol, begins and extends for 18 miles; its surface is totally without water, and the Atalik has consequently built a well and a small mosque at the 13th mile. After crossing this desert, the road passes at 9 miles Koki Robat, a small village where there are two guards to examine passports; at 11 miles the village of Talunghiz; at 14 miles another Karawal or Lungar (halting-place).

From this Karawal the road for the first few miles runs through a low jungle of reeds; at 11 miles it passes the village of Urgund, and the country is called Karakum, from its black sandy soil; at 12 miles Boghet; at 13 miles crosses the Opiai Canal by a wooden bridge; and at 18 miles enters the city of Yarkund. The road from Kashgar to Yarkund, about 120 miles, is traversed by carts, and with very little expenditure could be made into a good road.

The Mirza reached Yarkund about noon on the 12th of June, 1869, and at his own request was taken to the house of the Kafila Bashi Wahab, who had piloted him across the Pamir Steppe. The Mirza thought that this private house would be more convenient than a public caravanserai for taking his observations, and he was consequently rather disappointed when an order came the next day for him to live near the house of Ahmad Ali, the Aksakál, or chief, of the Yarkund Kashmiris. As soon as news of the Mirza's arrival reached the Shagāwal, or Governor of Yarkund, he sent the Mirza some uncooked provisions. This Governor, whose name is Mahomed Yūnas (Jonas), was very friendly and saw the Mirza very often; both he and the Aksakál expressed themselves as being very well inclined to the British Government, though they did not think it advisable to say so in public. The Mirza was in want of money, but he could not make any satisfactory arrangement until he found a Kabuli, in the service of the Shagāwal, who wanted to remit money to his family in Kabul. With this loan and the sale of some of his things, the Mirza was able to complete the number of ponies required for himself and his party, and to provide for provisions as far as Ladak.

Whilst he was making these arrangements his men again

became troublesome, and matters were nearly brought to a climax by one of them who had fallen in love with a Yarkundi woman: this man vowed that if he was not given a large sum of money and allowed to remain behind to marry the woman, he would divulge everything he knew about the Mirza; he knew all about the observations, &c., and the Mirza was consequently greatly puzzled to know what to do with him, as the man was in such a demented state about the woman. At last, after consideration, he got the Kabuli to assist by explaining that if the man left the Mirza he would most assuredly be carried off to the Atalik as a Hindustani slave: this probable result frightened the man, and a small sum of money enabled him to get clear of the matter, much to the Mirza's relief.

Mahomed Yūnas Shagāwal Dādkhwāh, or Governor of Yarkund, is about fifty years of age. He is a Tājūk of good family from Tashkand, formerly in the Kokhan service; he was one of the supporters of the Atalik in the taking of Kashgar, and distinguished himself so much that he has gained the entire confidence of the Atalik. He has a better knowledge of Arabic and Persian than any of the Kashgar Moolahs, and he has received a good general education. He is a pleasant man to deal with in every way, and has liberal ideas as to foreign countries.

The city of Yarkund is built on level ground, about five miles to the north of a large river which flows from west to east. The city is enclosed by a ditch and a thick mud wall, with towers at intervals. It has a large covered bazaar like the Kashgar one, wide enough for the carts; but the streets generally are irregular, and too narrow to permit carts to pass. At the points where three or four streets intersect, there is always a small tank filled by the canals taken from the river. In summer these tanks are filled once a week, but, notwithstanding that, the water is dirty and full of worms, and generally has an offensive smell. The Mirza counted sixty-seven small canals running through the city—the people say there are 300, possibly referring to the minor branches; however the canals are very numerous. The houses of the rich are built in large open squares surrounded by high walls; these squares are well stocked with fruit trees. The houses generally are, as in Kashgar, built with sun-dried bricks. There are about 120 mosques and madrussas (schools), and twelve caravanserais, the latter are filled with goods of every country. The schools are always attached to the mosques; and endowment of land, houses, and shops are given by the Government to pay for the education of the poor. Nearly every street has its mosque and school. The

children are taught to read the Koran, and a few books in the Turkish language.

There are no remarkable buildings in the city. The Chinese citadel is still standing on the north side of the city, near one of the gates. It is now the residence of the governor, and has a garrison of about 2000 Sirbazes, and a few guns disposed inside the gates.

Amongst the men there are about 100 Afghans commanded by General Shukrallah, who drills them after the English fashion. These men had formerly been in the Bokhara service, which they left in order to try and get into the Russian service, but failing they joined the Atalik's forces. The present governor has built a new mosque and a school on an elevated piece of ground near the northern angle of the city. It is painted inside, and has gilt pillars and beams. Inside its court there is a fine tank supplied from the canal.

The shops are open all day, and every evening there is a regular market to which the country people bring their goods for sale. The population is just as mixed as that of Kashgar, including in addition some men from Little Thibet; the people generally are Suni Mahommedans; they are good-humoured and honest, unless they happen to have been corrupted by Kashmiris. The city is said to contain about 80,000 people, women preponderating. Their diet is simple, generally consisting of dry cakes and hot tea. They are more hospitable than the Kashgaris, and supply their guests with food. The features of the people, their language, and dress are very much the same as the Kashgaris. Goitre is very common in the city, and in the country round, but it is unknown in Kashgar. The country round about is covered with villages, the whole plain is irrigated by numerous canals, and every scrap of ground is taken up either by fields or gardens; the soil is very productive, and a large amount of grain is exported to Kashgar. The grains and fruits are the same as at Kashgar. Fuel is plentiful. Yarkund is hotter in the summer than Kashgar.

There was formerly a large traffic between China and the Kashgar territory, but it has been entirely stopped since the downfall of the Chinese rule: the chief trade is now with Russia by the Kokhan route, but this has latterly been much diminished, owing to the jealousy between the Kokhan and Kashgar governments. The current money consists of "pulls," a copper coin with a square hole in the centre; of "tungas," a larger copper coin worth twenty-five "pulls;" and twenty-six "tungas" being worth one rupee. A gold coin (tillah) worth six to seven rupees is also used, and a lump of silver called "yamu,"

worth Rs. 160. The Yarkund River, which flows about three or four miles south of the city, rises in the Karakoram and Mustagh mountains, and after leaving the higher mountains is joined by the Sirikul River; then taking a bend it flows rapidly past Yarkund, taking a north-easterly direction, and is joined successively by the Khotan and Kashgar Rivers somewhere near Moralbāshi, which gives its name to a very extensive forest or jungle which extends, as stated above, to within three or four miles of Kashgar. This jungle harbours a number of wild beasts, such as tigers, wolves, &c.; which makes the road to Aksu dangerous for solitary travellers. The Mirza stayed in Yarkund about a month, and after getting a passport he started on the 14th July for Ladak. The governor despatched a messenger after him, and requested that he would send him some drill-books and a supply of gun caps as soon as he got into Hindustan. The Mirza was then allowed to go on his way without farther interruption.

The Mirza travelled from Yarkund with a Kafila of about 300 men, a great number of them being pilgrims, mostly men and only a few women, all *en route* to Mecca. The Kafila took the old Karakoram route, and the Mirza said they none of them knew anything about the Changchenmo route, and never even mentioned it. The Mirza crossed the Karakoram Pass in safety, and reached Leh, the capital of Ladak, during August; thence he made his way to Kashmir and back through the Punjab to the Head Quarters of the Great Trigonometrical Survey, having been absent on his expedition nearly two years.

OBSERVATIONS FOR LATITUDES TAKEN IN CENTRAL

No. of Observations.	Astronomical Date.	Watch Time.	Stations	Object on Meridian.	Upper or Lower Transit.
..	1868. Sept. 16..	H. M. 8 40 A.M.	Cabul	α Polaris.	..
..	,, 16..	9 5	Ditto	,,	..
..	,, 19..	8 10	Ditto	,,	..
..	,, 21..	8 2	Ditto	,,	..
..	,, 25..	Noon.	Ditto	Sun.	..
..	,, 26..	Noon.	Ditto	,,	..
..	,, 27..	Noon.	Ditto	,,	..
..	Oct. 20..	Noon.	Surkh Dur	Sun.	..
..	Nov. 1..	H. M. 7 0	Tashkurgan (Khulm)	α Polaris.	..
..	,, 1..	Noon.	Ditto ditto	Sun.	..
..	,, 2..	Noon.	Ditto ditto	,,	..
..	,, 2..	H. M. 6 35	Ditto ditto	α Polaris.	..
..	,, 30..	Noon.	Rustak	Sun.	..
..	Dec. 2..	H. M. 6 0	Ditto	α Polaris.	..
..	,, 2..	6 15	Ditto	,,	..
..	,, 11..	..	Faizabad	Sun.	..
..	,, 11..	7 9	Ditto	α Polaris.	..
..	,, 11..	6 42	Ditto	,,	..
..	,, 11..	7 30	Ditto	,,	..
..	,, 11..	8 0	Ditto	,,	..
..	,, 11..	7 0	Ditto	Jupiter.	..
..	,, 12..	..	Ditto	Sun.	..
..	1869. Jan. 27..	9 0	Sirikul	α Polaris.	..
..	,, 27..	9 10	Ditto	,,	..
..	,, 27..	9 30	Ditto	,,	..
..	Feb. 1..	Noon.	Yangi Shahr	α Polaris.	..
..	,, 2..	Noon.	Ditto ditto	,,	..
..	,, 4..	Noon.	Ditto ditto	,,	..
..	,, 5..	Noon.	Ditto ditto	,,	..
..	,, 6..	Noon.	Ditto ditto	,,	..
..	,, 7..	Noon.	Ditto ditto	,,	..
..	,, 8..	H. M. 9 0	Ditto ditto	α Polaris.	..
..	July 22..	11 0	Sanju	Moon.	..
..	,, 24..	..	Ditto	,,	..

ASIA WITH POCKET SEXTANT No. 34.

Double Altitude.	Single Altitude.	Index Error.	Deduced Latitudes.	Mean Latitudes.	Remarks.
° ′			° ′		
69 57	..	— 1′	34 29		Throughout α Polaris was not on Meridian.
70 28	..	,,	34 36		
69 42	..	,,	34 30		
69 40	..	,,	34 20	° ′ 34 28	Griffith gives 34° 30′ 34″.
109 27	..	,,	34 19		
108 35	..	,,	34 22		
107 33	..	,,	34 29		
89 36	..	,,	34 45	34 45	Griffith gives 34° 49′ 51″ for Bamian, which is close to Surkh Dur, and nearly in same parallel of latitude.
75 5	..	,,	36 39		
77 47	..	,,	36 35		
77 13	..	,,	36 33		
				36 37	By Wood's Map 36° 40′.
74 53	..	,,	36 41		
62 51	..	,,	36 54		
76 41					
76 57	..	,,	37 16	37 5	α Polaris not on meridian.
59 52	..	,,	37 4	..	Atmosphere hazy.
77 2	..	,,	..	..	α Polaris not on meridian.
77 6	..	,,	..		
77 3	..	,,	37 7	37 2	By Wood's Map 37° 5′.
77 5	..	,,	..		
107 15	..	,,	36 56		
59 48	..	,,	37 1		
76 35	..	,,	..	..	Or Tashkurgan town with old fortress.
76 33	..	,,	37 44	..	α Polaris not on meridian.
76 37	..	,,	..	..	
66 51	..	..	39 34		Or Kashgar, about ¼ mile N.W. of new fort. The new fort being about 5 miles south-east of the old city of Kashgar.
67 45	..	..	39 24		
68 36	..	..	39 34		
69 36	..	..	39 22	39 26	
70 5	..	..	39 26		
70 43	..	..	39 26		
79 20	..	..	39 19	..	α Polaris not on meridian.
62 22	..	..	37 49		
79 25	..	..	37 15	37 11	

OBSERVATIONS OF THE BOILING-POINT TAKEN IN KASHGAR, SIRIKUL, AND OTHER PLACES IN CENTRAL ASIA.

Number of Observation	Month and Date	Watch Time	Station	Thermometer				Deduced Height above Sea	Remarks
				No.	Boiling Point		Air		
	1868								
16	Nov. 30..	10 A.M.	Rustak	XC.	205·2	..	58·1	5,080	
17	Dec. 12..	11 A.M.	Faizabad	,,	205·2	..	54·1	5,081	
	1869.								
18	Jan. 3..	4 P.M.	Ush Kishlim	,,	195·2	..	45·1	10,805	
19	,, 5	10 A.M.	Kundood	,,	195·5	..	45·9	10,057	
20	,, 10	9 A.M.	Nist	,,	193·5	..	45·0	11,806	End of Wakhan Valley.
21	,, 11..	1 P.M.	Langhar Pamir	,,	192·5	..	..	12,128	Mercury sank so low that thermometer could not be read.
22	,, 14	5 P.M.	Lake Pamir Kul	,,	190·5	..	..	13,259	Ditto
23	,, 26	4 P.M.	Aktash	,,	194·1	..	..	12,914	Eastern extremity of Pamir Steppe, ditto
24	,, 27..	4 P.M.	Tashkurgan	,,	194·5	..	..	10,986	Or Sirikul. Ditto.
25	,, 30	4 P.M.	Charlung Valley	,,	193·5	..	..	11,556	Ditto
27	Feb. 3..	11 A.M.	Yangi Shahr or new Kashgar	,,	205·1	..	..	5,087	Ditto. Inside a house. Yangi Shahr, or new Kashgar, is about 5 miles south of the old town of Kashgar.
26	June 1..	4 P.M.	Yangi-Hissar	,,	205·1	..	84·0	5,166	
28	June 22..	11 A.M.	Yarkund	,,	207·1	..	80·0	4,000	Inside a house.
	1867.								
	Oct. 10..	4 P.M.	Mussoorie, G. T. Survey Office ..	,,	201·9	..	62·0	6,876	Trigonometrical height.

NOTE.—The height of Yarkund deduced from former explorations, viz., 4000 feet, has been used in computing the above heights, but the observations taken at Mussoorie, before the instrument left, indicate a somewhat less altitude, viz., 3891 feet for Yarkund, but the heights have not been altered for this as the thermometer was unfortunately broken before the Mirza returned, and there were no means of testing its zero. Judging from the results of other explorers, Kashgar and Yangi-Hissar are too high as given in the above list, and as they depend upon single observations with a very small thermometer it is probable that they may be so.

ROUTE-SURVEY FROM CAUBUL TO KASHGAR, *viâ* BADAKSHAN, &c., IN CENTRAL ASIA.

Station Number.		Bearings of Forward Station.		Distances in Miles to Forward Station.	Remarks.
		°	′		
	1 ..	253	0	14·5	Caubul City.
	2 ..	275	0	11·0	
	3 ..	246	0	14·0	
	4 ..	270	0	5·0	
	5 ..	305	0	18·0	
	6 ..	..		18·0	
	7 ..	313	0	3·8	
	8 ..	280	0	6·0	
	9 ..	330	0	3·0	
	10 ..	350	0	6·0	
	11 ..	260	0	3·5	
	12 ..	340	0	3·5	
	13 ..	270	0	6·5	Bamian.
Bamian	.. ..	275	0	3·5	
	14 ..	310	0	8·0	
	15 ..	20	0	19·0	
	16 ..	270	0	5·0	
	17 ..	355	0	10·5	
	18 ..	75	0	8·5	
	19 ..	350	0	10·5	
	20 ..	34	30	8·5	
	21 ..	310	0	5·5	
	22 ..	24	0	5·5	
	23 ..	330	0	6·5	
	24 ..	40	0	9·0	
	25 ..	103	0	5·0	
	26 ..	20	0	13·0	
	27 ..	345	0	2 5	
	28 ..	310	0	4·5	
	29 ..	320	0	8·0	
	30 ..	350	0	18·0	
	31 ..	345	0	8·0	
	32 ..	315	0	16·0	
	33 ..	357	0	2·5	Tashkurgan.
Station ..	1 ..	75	0	19·0	
	2 ..	85	0	8·8	
	3 ..	80	0	28·0	

ROUTE-SURVEY FROM CAUBUL TO KASHGAR, &c.—*continued.*

Station Number.	Bearings of Forward Station.	Distances in Miles to Forward Station.	Remarks.
4 ..	° ′ 55 0	13·0	Kunduz.
Kunduz	130 8	5·0	
6 ..	60 0	7·5	
7 ..	55 0	10·0	
8 ..	90 0	8·0	Talakhan.
Talakhan	25 0	7·5	
10 ..	50 0	7·5	
11 ..	12 0	5·5	
12 ..	70 0	2·5	
13 ..	45 0	4·0	Rustak.
Rustak	98 0	5·0	
15 ..	140 0	3 0	
16 ..	68 0	5·0	
17 ..	90 0	6·5	
18 ..	40 0	3·5	
19 ..	70 0	11·0	
20 ..	130 0	3·5	
21 ..	60 0	9·0	Faizabad.
Faizabad	145 0	5·0	
2 .	65 0	6·0	
3 ..	130 0	8·5	
4 ..	103 0	10·0	
5 ..	175 0	9·5	
6 ..	135 0	10·0	
7 ..	110 0	10·5	Zebak.
Zebak	110 0	0·5	
8 ..	35 0	6·0	
9 ..	60 0	7·0	
10 ..	50 0	4·0	Ishkashim.
Ishkashim	90 0	10 0	
12 ..	60 0	6·0	
13 ..	40 0	11·0	
14 ..	55 0	14·0	
15 ..	48 0	8·0	Punja Fort.
Punja Fort . ..	75 0	18·0	
17 ..	105 0	14·0	
18 ..	140 0	1·5	
19 ..	85 0	8·0	

ROUTE-SURVEY FROM CAUBUL TO KASHGAR, &c.—*continued.*

Station Number.	Bearings of Forward Station.	Distances in Miles to Forward Station.	REMARKS.
	° ′		
20 ..	70 0	10·0	
21 ..	85 0	10·0	
22 ..	140 0	2·0	
23 ..	100 0	6·0	
24 ..	70 0	23·0	
25 ..	50 0	14·0	
26 ..	60 0	23·0	
27 ..	40 0	11·0	
28 ..	30 0	2·0	
29 ..	..	5·0	
30 ..	70 0	2·0	
31 ..	90 0	6·0	
32 ..	35 0	2·0	
33 ..	60 0	4·0	
34 ..	20 0	10·0	
35 ..	70 0	3·0	Tashkurgan or Sirikul.
Tashkurgan ..	350 0	10·0	
37 ..	..	5·0	
38 ..	110 0	20·0	
39 ..	100 0	7·0	
40 ..	60 0	8·0	
41 ..	10 0	4·0	
42 ..	90 0	3·5	
43 ..	28 0	13·0	
44 ..	40 0	10·0	
45 ..	5 0	9·0	
46 ..	80 0	6·0	
47 ..	112 0	7·0	
48 ..	..	16·0	
49 ..	340 0	36·0	Yanga Shahr or new town of Kashgar.
50 ..	312 0	5·0	Kashgar (old city).
Kashgar	160 0	36·0	Yangi-Hissar.
Yangi-Hissar ..	145 0	31·5	
2 ..	110 0	18·5	
3 ..	130 0	14·0	
4 ..	98 0	18·0	Yarkund.
Yarkund.	..	..	

STAGES on the ROUTE from CAUBUL to BADAKSHAN up the RIVER OXUS, and across the PAMIR STEPPE by SIRIKUL to KASHGAR in EASTERN TURKISTAN.

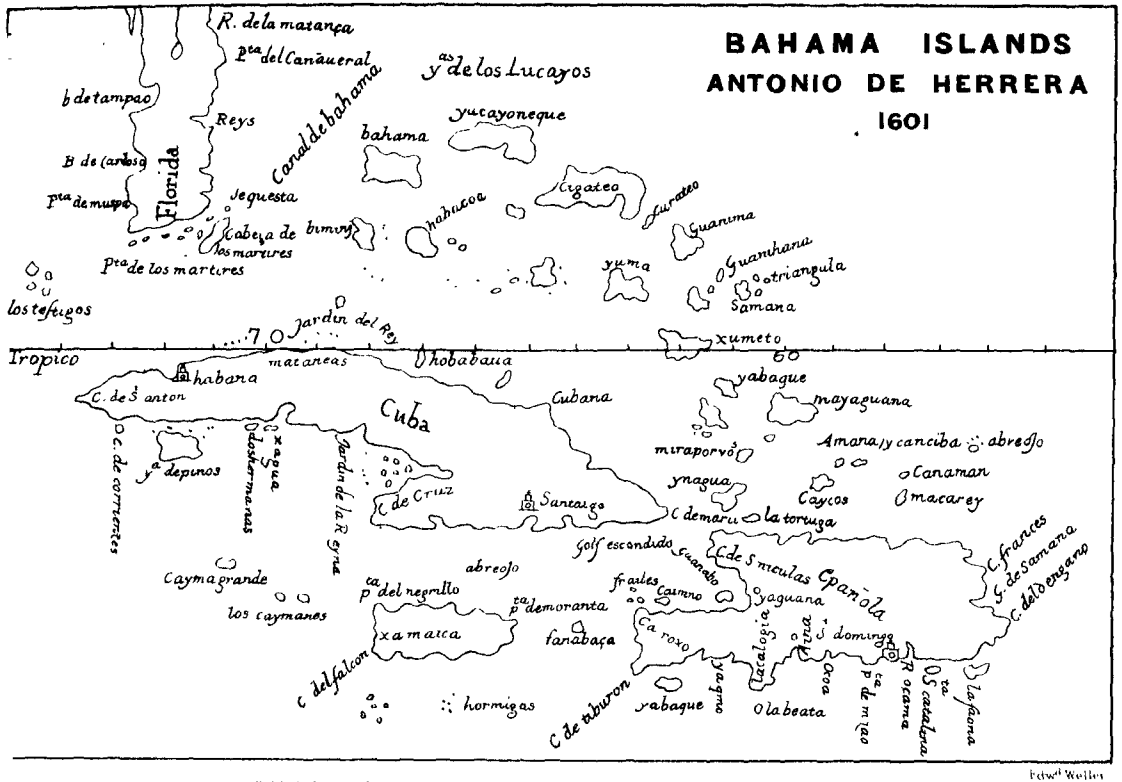
Number of Marches	Names of the Daily Halting places for ordinary Marches.	Estimated Number of Miles from Stage to Stage.	REMARKS.
1	Caubul Kot Hashtrū	16½	A small village from which supplies in small quantities are procurable. Bad encamping-ground.
2	Sakani	13	A good caravanserai and custom-house. Encampment on bank of Surchasma Stream.
3	Gurdandeewar ..	23	A small mud fort on the right bank of the River Helmund. Encampment on bank of the river.
4	Kulloo at Kila Murtaza Khan.	20	On the road to this place several mud forts are seen.
5	Topchi	12½	A small mud fort. Provisions are scarce at this place. Plenty of pasture for cattle.
6	Bamian	11½	A small village famous for its gigantic idols, also for the excavations made by the people.
7	Surkh Dur	3½	A small village where grass is abundant.
8	Akrabad	12	The site of a dilapidated mud fort. No provisions.
9	Saigān	17	Near small fort, on a hill. Encamping-ground good.
10	Kamurd	11	A small mud fort on the left bank of the river. Grass abundant.
11	Muddar	12½	A small military post stage at the foot of the Korakhol Mountain. Supplies not procurable here, though grass for cattle abundant.
12	Doab Shah Pusund Khan	12½	A small mud fort situated at the junction of two streams. Camp supplies are scarce here, but grass abundant for cattle.
13	Rui	25	A small military post. Pasture for cattle abundant.
14	Kurrum	17	A small rambling village with good pasture.
15	Foot of Kohil Mountain	17	The country from this point looks wild, and all the villages are at a distance.
16	Asia Badee	19	A ruined windmill.

ROUTE from CAUBUL to BADAKSHAN, &c.—*continued.*

Number of Marches.	Names of the Daily Halting places for ordinary Marches.	Estimated Number of Miles from Stage to Stage.	REMARKS.
17	Guznīguk	5	A small village surrounded by fine pasture lands on the brow of a hill.
18	Tashkurgān	20	A large town.
19	Ungarik	9	A small village.
20	Abdān, 2nd	20	A well in the desert.
21	Karabagh	23	A small village.
22	Kundooz	7	A town proverbially known to be unhealthy.
23	Khanabad	12½	A small fort on the right bank of stream.
24	Talakhan	18½	A town.
25	Ass .. .. / Girdab	2 / 13 } 15	A small village. / A small village stands on the opposite bank of the River Kokcha.
26	Rustak	11	A town in Badakshan.
27	Alkashim	8½	A small village is seen from this place situated about 3 miles distance from the road and at the foot of the hill.
28	Atamjallo	15	A village consisting of about 40 houses. Provisions are, however, not procurable, and the encamping-ground is bad.
29	Caohar Dara	11	A village of 100 houses on the slope of a hill.
30	Faizabad	12	Chief town of Badakshan.
31	Chupchi	19	A small village where supplies are not procurable.
32	Chokaran	10½	A small village where provisions and supplies are not procurable.
33	Yomullo	6½	Ditto.
34	Teergahran	6	Ditto.
35	Zebak	18	A small village consisting of about 20 houses.
36	Zurdkhan	5	A small village where supplies are not procurable.
37	Ishkashim	14	Several small forts are visible from this, situated along the opposite bank of the Punja or Oxus River.
38	Gazda	9	A small village.
39	Shekurb	11	Ditto.

ROUTE from CAUBUL to BADAKSHAN, &c.—*continued.*

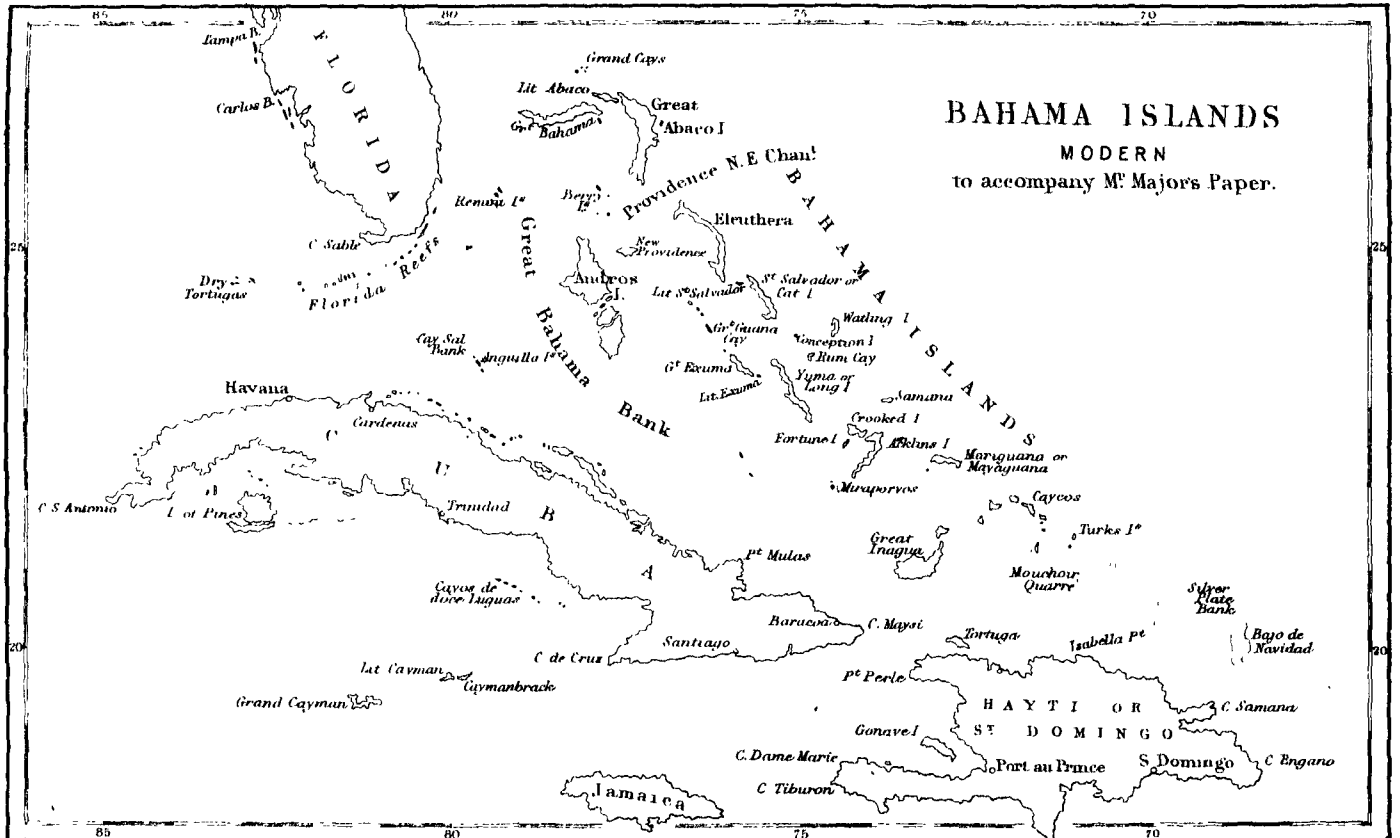
Number of Marches.	Names of the Daily Halting places for ordinary Marches.	Estimated Number of Miles from Stage to Stage.	REMARKS.
40	Oregund	12	A small village.
41	Kundood	14	Ditto.
42	Punja Fort	16	A small fort made of stones cemented with earth, and considered of great importance. The town of Punja at this place is the chief one of the Wākhā or Wākhān Valley.
43	Raz Khan	17	A small village.
44	Patur	15½	Ditto.
45	Degoloman	14	Ditto.
46	Patur, 2nd	12	Ditto.
47	Camp	12	In bed of main branch of Oxus River.
48	Near Lunghar ..	13	A halting-place. The commencement of the Pamir Steppe.
49	Ruin of a Kirghiz building.	13	Country from this point onwards is very wild.
50	Lake called Pamir-kul or Barkut Yassin.	9	This lake from its western end gives rise to the main branch of the upper River Oxus, and is on the crest of the Pamir Steppe.
51	Camp in Pamir Steppe.	23	In the midst of hillocks.
52	Ak tash	20	On the bank of Sirikul Stream.
53	Camp	18	In low jungle and grass.
54	Tashkurgan or Sirikul.	6½	A fort in the Sirikul Valley.
55	Shukrab	18	The country extending over these distances is a barren waste, and the inhabitants live entirely on the milk and flesh of their herds and flocks.
56	Kirghiz	27	
57	Camp in jungle	5	
58	Akul	8	
59	Keen Valley	20	
60	Kipchak	12	
61	Karāwal	16	A well-built fort.
62	Yangi Hissar	20	A small town.
63	Opechan	19½	A village.
64	Kashgar new town	16½	Or Yanga Shahr. The seat of government.
	Kashgar old city ..	5	



Herrera	Modern
Bahama	G.t Bahama I.d
Bimini, Habacoa	Andros I.e
Cabeça de los Martires	Cay Sal Bank
Yucayoneque	G.t Abaco I.d
Cigateo	Eleuthera
Curateo	Little S. Salvador
Guanima	S. Salvador or Cat I.s
Anonymous between Habacoa & Yuma	Great Exuma
Guanihana	Watling I.d
Yuma	Yuma
Samana	Samana
Xumeto	Crooked I.d
Yabaque	Acklin. I.d
Mayaguana	Mariguana
Caycos, Amana	The Caycos Group
Canciba	Turks I.s
Abrejo	Mouchoir Carré
Canaman	Silver Plate Bank
Macarey	Navidad or Ship B.
Mira por vos	Miraporvos
Ynagua	G.t Inagua
La Tortuga	Tortuga

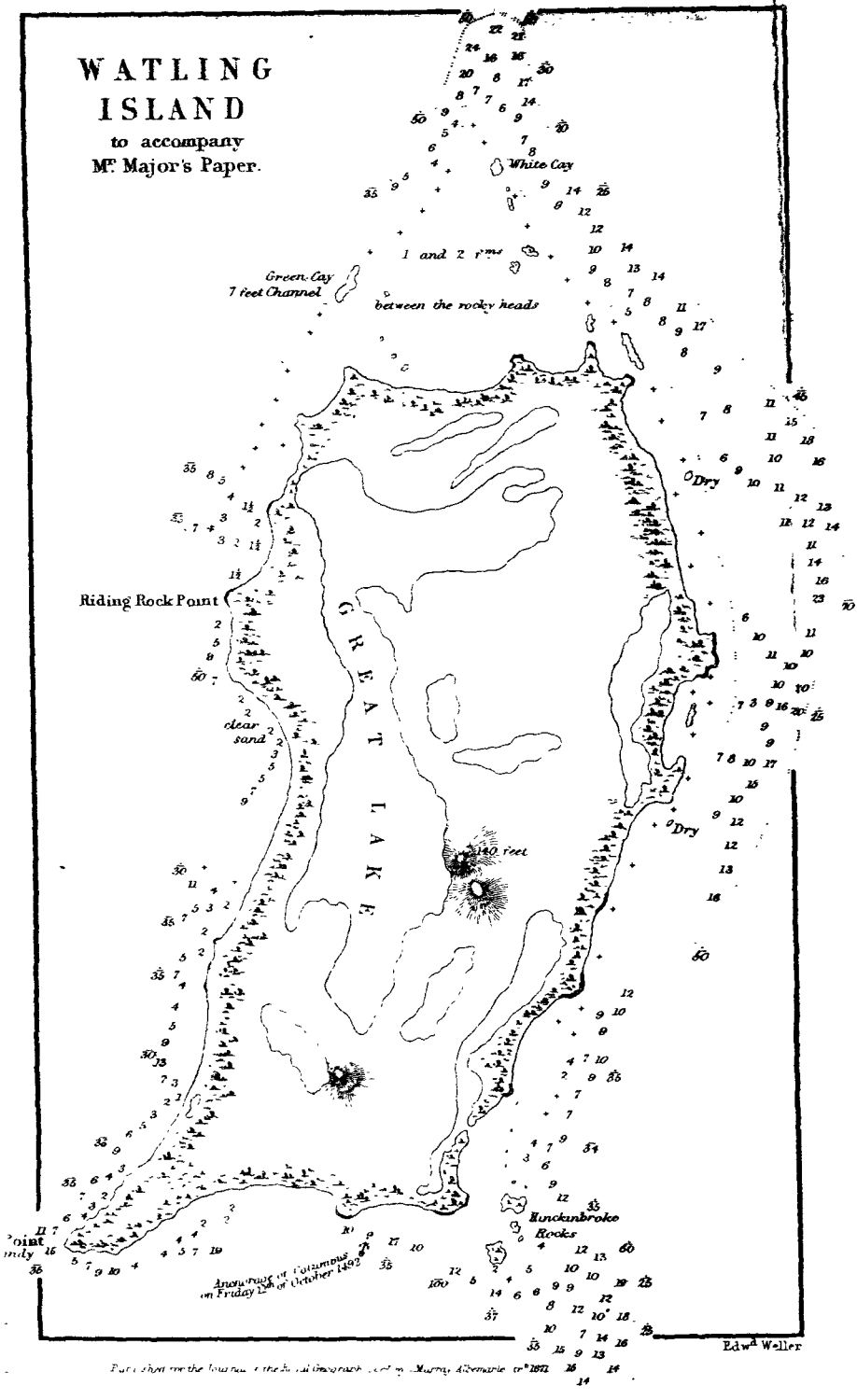
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Edw.d Weller



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WATLING
ISLAND
to accompany
Mr. Major's Paper.
White Cay
1 and 2 fms
Green Cay
7 feet Channel
between the rocky heads
Dry
Riding Rock Point
GREAT LAKE
clear
sand
40 feet
Dry
Hunkanbroke
Rocks
Edwd Weller

STAGES on the ROUTE between KASHGAR and YARKUND by YANGI HISSAR.

Number of Marches.	Names of the Daily Halting places for ordinary Marches.	Estimated Number of Miles from Stage to Stage.	REMARKS.
	Kashgar to—		
1	Opechan	16½	A village.
2	Yangi Hissar ..	19½	A small town.
3	Kulpan	13½	A village.
4	Kazil	18	Ditto.
5	Koki Robat	18½	Ditto.
6	Karawal or Lungar	14	A village and military post.
7	Yarkund	18	City.

VII.—*The Landfall of Columbus.* By R. H. MAJOR, Esq., Secretary R.G.S.

Read May 8th, 1871.

IN the midst of the pleasure that we are so frequently deriving from the narratives of gallant explorers of the present day in distant and unfrequented lands, it is not amiss that we should occasionally look back with a loving interest to the deeds of our predecessors in the same glorious and useful career, to whom we owe so much. To the antiquary or lover of history, the spot in the New World which was first lighted on by that Prince of Navigators, Christopher Columbus, in his hazardous search for the Indies across the Sea of Darkness, cannot fail to be a matter of curiosity. It happens, however, that the identification of that locality is a matter not of historical curiosity alone, but of practical utility; inasmuch as for nearly two centuries the name which Columbus gave to that spot has been applied to an island to which it never belonged, and a misapplication of nomenclature in geography is a point to which geographers cannot or ought not to be indifferent.

It is well known to all that Columbus gave the name of San Salvador to the island which he first discovered, and that its Indian name was Guanahani. In the year 1847, when I had the honour to edit for the Hakluyt Society the 'Select Letters of Christopher Columbus, illustrating his Four Voyages to the

New World,' I fell into a great mistake in adopting too readily the conclusions of Navarrete, that the Great Turk, the northernmost of the Turk Islands, was the true Landfall. I did so under the following process of reasoning. My predecessors in the consideration of the subject had been the learned Juan Bautista Muñoz, in his 'Historia del Nuevo Mundo' (Madrid, 1793); Navarrete, in his 'Coleccion de los Viages y descubrimientos que hicieron por mar los Españoles desde fin del Siglo XV.' (Madrid, 1825, tom. i.); Washington Irving, in his 'Life of Columbus' (London, 1828); and the Baron Alexander von Humboldt, in the year 1837, in his 'Examen critique sur l'histoire géographique du Nouveau Continent.' It was the opinion of Muñoz that Guanahani was Watling Island. Navarrete, as I have just stated, placed it in the Grand Turk, far to the east; while Washington Irving and Humboldt made it to be Cat Island, to the west—the same island which, for nearly two centuries, had borne on maps the name of San Salvador. Such different conclusions, formed by thoughtful men from an examination of the Diary of Columbus, and other early documents, caused me to set a great value upon any modern *reconnaissance* of the locality which might throw a fuller light upon these documents, and perhaps show which of the conclusions was correct. Now, it so happened that a communication, made a short time previously to the New York Historical Society by Mr. Gibbs, a resident on Turk's Island, presented several points of evidence apparently confirmative of the correctness of Navarrete's deductions. The most imposing of Mr. Gibbs's arguments —admitted, I am sorry to say, by me, in 1847, without that amount of scrutiny which was due to the subject—were the following. Columbus, he says, states in his Diary that there were several islands in sight from Guanahani. Now, Columbus did not say this, but that, after he had sailed from Guanahani, he saw several islands. When Mr. Gibbs visited the island now called San Salvador (Cat Island), he sent sailors aloft to look out for land, and himself ascended the highest part of the island; but, though the weather was clear, no land was visible. The Diary speaks of soundings to the eastward of Guanahani: there were none to the eastward of San Salvador. The Spaniards sailed round Guanahani in one day—with San Salvador this would be impossible. This, again, is a mistake of Mr. Gibbs. It is nowhere stated in Columbus's Diary that he sailed round Guanahani, a fact of importance to which I shall afterwards have to ask your attention. All the marks wanting at San Salvador were found at Turk's Island. The journal describes Guanahani as well wooded, and having much water; a large lake in the centre, and two several running streams flowing

into the sea. Turk's Island has about one-third of its surface covered with lakes of salt and fresh water, and some of these formerly communicated with the sea, except at certain seasons when storms choked up the outlets with sand. A few years before, vessels had sailed into one of the ponds. The island, though now without trees, was known to have been formerly well wooded; and Mr. Gibbs recollected some remains of the forest existing in his youth. Moreover, the Diary makes no allusion to the Great Bahama Bank, which must have been passed in approaching San Salvador. This, again, is a mistake. In approaching Cat Island from the north-east, the Great Bahama Bank would not have been passed.*

As Mr. Gibbs's personal observations thus seemed to corroborate the deductions of Señor de Navarrete, I yielded to this combination of apparent evidence, and so submitted it to the reader. Since that time, however, we have seen other arguments in which local investigation, as well as the examination of the early documents, have resulted in conclusions as divergent as those which preceded them. Captain Becher, R.N., of our own Hydrographic Office, in a thick octavo volume, entitled 'The Landfall of Columbus,' published London, 1856, examining the question from a seaman's point of view, fell in with the opinion formed by Muñoz, in 1793, that Guanahani was Watling's Island; and this view was, in the following year, supported by the eminent German critic, Professor Oscar Peschel, of Augsburg, in No. 20 of 'Das Ausland.' Since, then, however, a new advocate, with a new *protégé*, has appeared in His Excellency Senhor Fr. Adolph de Varnhagen, Brazilian Minister to the Court of Vienna, who, in 1864, published, at Santiago de Chile, a work, entitled 'La Verdadera Guanahani de Colon' ('The true Guanahani of Columbus'), in which he maintains the unique opinion that it was the island of Mayaguana. This work Senhor de Varnhagen republished in German, in 1869, in Vienna, where, in the same year, he also published a pamphlet, 'Sull' importanza d'un Manoscritto Inedito della Biblioteca Imperiale di Vienna per verificare quale fu la prima isola scoperta dal Colombo.' Under such circumstances, it becomes a duty in me to revise my old opinion, and to see whether I can discover any process by which the question may be definitely settled. It is in the belief that I have succeeded in so doing that I venture to occupy your attention now.

My first duty will be to cull the necessary extracts from the Diary of Columbus himself, the one important document on which the calculations of the disputants must be based;

* *Vide* 'Athenæum' for 1846, page 1274.

but, before I do so, I will mention that I have studied on the chart of Watling Island the track of Columbus, as suggested by Captain Becher, and which a close examination has led me to accept as correct, with the exception of a small portion, on which I am at issue with him. I have not included the tracks suggested by others, because I have conclusive arguments, as I hope, to lay before you for the summary and distinct exclusion of every one of them. It was on the 11th of October, 1492, that land was first seen, and under that date stands the following entry:—

"*Thursday, October* 11.—Sailed W.S.W. Had much sea—[more than they had had in the whole voyage.] Saw some pardelas and a green rush close to the ship. The sailors of the caravel *Pinta* saw a reed and a stick; and they picked up another small bit of wood, carved apparently with an iron tool, also a piece of cane, some other fragments of land vegetation, and a small board. The sailors of the caravel *Nina* also saw some signs of land, and a small piece of wood covered with dog-roses. At these indications they drew in their breath, and were all full of gladness. That day they made twenty-six leagues before sunset. After sunset, sailed the original course to the westward, made twelve miles an hour, and by two o'clock after midnight they had made ninety miles, *i. e.*, twenty-two leagues and a half; and as the caravel *Pinta* was the best sailer and was in advance of the Admiral, she found the land and made the signals that the Admiral had commanded. The land was first seen by a sailor, named Rodrigo de Triana; for at ten o'clock at night the Admiral, while standing on the quarter-deck, saw a light, although it was so indistinct that he would not say with certainty that it was land; but he called to Pero Gutierrez, the King's groom of the chambers, and told him there was a light in sight, and desired him to look out, and so he did, and saw it. He also spoke of it to Rodrigo Sanchez, of Segovia, who had been sent out as supervisor by the King and Queen; but he, not being in a good position for seeing, saw nothing. After the Admiral had mentioned it, it was observed once or twice. It was like a small wax candle, which was lifted up from time to time, which few would take to be a sign of land; but the Admiral held it for certain that land was close by. After the Salve, which all the sailors were in the habit of saying and singing in their own fashion, while they were all assembled, the Admiral begged and admonished them to keep a good look-out for land from the bows, and promised an immediate present of a silk doublet to him who should first call out that he saw land, besides the reward that had been promised by the Sovereigns, viz., an annuity of ten thousand maravedis

to him who first saw land. At two o'clock after midnight the land appeared at two leagues distance. They struck all sail except the storm-squaresail, without topsails; and they lay-to until Friday the 12th of October, when they reached a small island of the Lucayos (the Bahamas), which was called in the Indian language Guanahani.

"Presently the people came towards us. They were quite naked. The Admiral went on shore in an armed barge, and took possession of the island for the King and Queen." Here I need not pause longer to quote any other items of description, beyond those which affect our immediate question. The Admiral states that the island lay east and west on line with Ferro in the Canaries. This is a palpable mistake, although one for which allowance can easily be made under the circumstances, for the latitude of Ferro is 27° 42′ 5″ N., while the Great Bahama Island and the Great Abaco Island, the northernmost of the group, the position of which precludes their identification with the Landfall of Columbus, are considerably to the south of that latitude.

Columbus, perceiving that the natives had gold about them, strove to learn from them where it could be procured, and, in consequence of their information, he says: "I determined to wait till to-morrow afternoon, and then to depart to the south-west for the purpose of seeking gold and precious stones. Many of them told him that there was land to the south, south-west, and north-west."

This passage shows that there were not, as Mr. Gibbs misquotes the Diary, several islands in sight from Guanahani.

He then says: "This island is *bien grande*, and very flat, with very green trees and much water, and in the middle a very large lake; there is no mountain in the island but it is all so green, that it is a pleasure to behold."

Now it is of great importance to notice this expression of the Admiral's that the island was *bien grande*, which may be translated "very large," or "tolerably large;" and, by way of enabling us to judge which of these is correct, we have two other mentions of the island by Columbus himself which ought to settle the question. Under date of the 11th and 12th October, he calls it in his Diary an "isleta" or small island; and, again, under the 5th of January, 1493, he reverts to this first expression, and calls it an "isleta." If this fact should not be considered by some sufficiently satisfactory, we must be content to leave the question to be settled by the surrounding evidence. But to proceed with the Diary:—

"*October* 14.—At daybreak I ordered the ship's boat and the caravel's barges to be manned, and I went along the island

in a N.N.E. direction to see the other part to the eastward, and also to see the habitations; and, presently, I saw two or three, and the inhabitants came down to the shore calling us. But I was alarmed when I perceived a great ridge of stones encircling the whole island, and, in the midst of it, a deep harbour, large enough to hold all the ships in Christendom, and the entrance of it very narrow. It is true that within this girdle there are some shoals, but the sea has no more motion than inside a well. I set myself this morning to see all this, that I might give your Highnesses an account of everything, and also to find where I could erect a fort. I observed a piece of land like an island, but it was not one. There were six houses in it, and in two days it might be converted into an island. I inspected the whole of that harbour, and then returned to the ship and set sail, and saw so many islands that I could not make up my mind to which I would go first. Some men, that I had taken, told me by signs that they were numberless, and they mentioned by name more than a hundred. Then I looked for the largest, and determined to go to it; and so I am doing. It will be distant from San Salvador five leagues (further on he says, seven), and the others some more, some less. All are very flat, without mountains, and very fertile. They are all very populous, and wage war with one another, but they are a very simple people, and personally well made.

"*October* 15.—I kept out all night, fearing to approach an anchorage before the morning, because I did not know whether the coast would be clear of shoals, and, as the island was more than five, or rather seven leagues off, and the tide detained me, it would be midday when I reached the said island. I found that the face of it, on the side towards San Salvador" [or rather, I would suggest, on the side approached by the ships in coming from San Salvador], "ran north and south five leagues, and the other side which I coasted ran east and west ten leagues; and, as from this island I saw another larger one to the west, I started for the purpose of sailing the whole of that day until night, for otherwise I could not have reached the westernmost cape." [Here I beg your attention to the fact that Columbus neither lands upon nor gives any name to the first island which he reaches after leaving Guanahani, a fact which argues its unimportance and sanctions our assuming it to be Rum Cay.] "I gave that island" [*i. e.* the larger one] "the name of Santa Maria de la Concepcion, and almost at sunset I anchored near the said cape to inquire whether there was gold. I remained at anchor until to-day, Tuesday (the 16th).

"At daybreak I went on shore with the boats armed, and the natives, who were numerous, were as naked and in the same

condition as those of the other island of San Salvador. They let us land, and gave us anything that they were asked for, but as the wind began to blow strong from the south-east I would not stay, and went back to the ship. . . . . I presently set sail for the other large island which I saw to the westward; and so I started at about ten o'clock with the wind south-east and a little south, to go to that other island, which is very large . . . . and from the island of Santa Maria to this other island is a distance of nine leagues from east to west, and all this part of the island runs north-west and south-east; and, apparently, the coast on this side is more than 28 leagues long. Like the islands of San Salvador and Santa Maria, it is very flat, and has no mountain in it, and all the beaches are without rocks, but all around these are sunken rocks just below the water, which make it necessary to keep a sharp look-out when wishing to anchor, and not to anchor very near the shore, although the water is always very clear and the bottom visible. In all these islands, at two gunshots from the shore, the bottom is too deep for soundings. These islands are very green and fertile, and the atmosphere very soft. This large one I call Fernandina.

"It was about midday on the 16th of October that I left the islands of Santa Maria de la Concepcion for Fernandina, which looms very large to the westward; and I sailed the whole of that day with calm weather. I could not reach it in time to be able to see the bottom for a clean anchorage, for great care is necessary not to lose the anchors, and so I waited all that night till next day, when I came to a settlement, and there anchored. The people very willingly showed my crews where there was water, and themselves brought the barrels full to the boats, and took pleasure in serving us. This island is very large, and I am determined to sail round it, because, from what I can learn, there is a mine of gold either in it or nearabouts. This island is eight leagues east and west of Santa Maria; and this cape to which I came, and the whole of this coast, runs N.N.W. and S.S.E., and I saw full 20 leagues of it, but it did not terminate there.

"*October* 17.—At midday I left the settlement where I had anchored and taken in water, in order to sail round this island of Fernandina. The wind was south-west and south; but my wish was to follow the coast of this island to the south-east, because all the Indians indicated by signs that there was gold to the southward in the island which they called Samoet; and Martin Alonzo Pinzon, captain of the caravel *Pinta*, into which I sent three of these Indians, came to me and said that one of them had very positively given him to understand that I should round the island much the quickest by the N.N.W. I

saw that the wind did not serve for the course which I had meant to take, but was favourable for the other course. Accordingly I sailed N.N.W., and at about two leagues from the point of the island I found a very remarkable harbour* with a mouth, or it might be called two mouths, for there is an islet in the middle. Both mouths are very narrow, and inside there is space enough for a hundred ships if it were deep and clear. It is deep at the entrance. I thought it worth while to examine and sound it, and so I anchored outside and went in with all the ship's boats and found there was no depth. Thinking it was the mouth of some river, I had ordered barrels to be taken for water, and on shore I found eight or ten men, who came to us and pointed out a settlement in the neighbourhood, to which I sent the crew for water, some with arms and some with barrels, and so they fetched it; but as it was some distance it detained me two hours. I then set sail and went north-west, and discovered all that part of the island as far as where the coast runs east and west. The Indians then returned to say that this island was smaller than Samoet, and that it would be well to turn back to reach it the sooner. Presently the wind subsided and began to veer to the W.N.W., which was contrary for the course we had been sailing, and so I turned back and sailed all that night E.S.E., sometimes due east, sometimes south-east, and this for the purpose of giving the shore a wide berth, for the weather was very heavy. There was little wind, and it did not allow me to put in to anchor. So it rained very heavily from midnight till near daybreak, and still the clouds threaten rain, and we are at the end of the island to the south-east, where I hope to anchor until it shall clear so that I may see the other islands to which I have to go.

"*October* 18.—After it cleared, I sailed with the wind and made straight for the island as well as I could, and when the time would not allow of sailing, I anchored, but did not go on shore.

"*October* 19.—At daybreak I weighed anchor and sent the *Pinta* to the east and south-east, the *Nina* to the S.S.E., and I went in the ship to the south-east, leaving orders that they should follow that course till midday, and then both should tack and steer for me. When we had sailed three hours we saw an island to the east, for which we made, and all three arrived before midday at its northern point, where there is an islet and a ridge of rock outside it to the north, and another between it

* I have not seen a chart of Great Exuma on a sufficiently large scale to verify this harbour, but Captain Barnett's West India pilot states that on the north coast are several secure harbours, with exceedingly narrow and intricate channels.

and the great island, which the men of San Salvador that I brought with me called Saometo, and I gave it the name of Isabella. The wind was north, and the said islet lay east and west of the Island Fernandina from the point where I had left it, and from this western islet the coast continued two leagues up to a cape, to which I gave the name of Cabo Hermoso [the beautiful cape] on the western side. It is beautiful, round, and very deep, without shoals outside of it. At first it is stony and low, but more inwards the beach is sandy, and here I anchored this Friday night until the morning. It is the most beautiful island that I ever saw. This land is higher than the other islands I have discovered, and in it is an eminence which one could not call a mountain, and it seems to have much water in the middle of the island. From hence to the north-east makes a great angle. There are many groves of thick and lofty trees, and herbs and valuable trees for dyes and medicine, and spices. The perfume from the flowers and trees was the sweetest thing in the world. What I call Cabo Hermoso, I think, is an island separate from Saometo.

"*October* 20.—At daybreak I weighed from where I had anchored at the south-west cape, to which I gave the name of Cabo de la Laguna, to sail north-east and east from the south-west and south part, and found the whole so shoaly that I could not enter nor sail in it, and I observed that on the track from the south-west there was a very great (*rodeo*) roundabout. I therefore resolved to retrace the course which I had taken from the N.N.E. on the westward side, and to round the island for the sake of reconnoitring it.

"*Sunday, October* 21.—At 10 o'clock I arrived at this Cabo del Isleo (Cape of the Islet) and anchored and landed. If the other islands are rich in beautiful vegetation, this is much more so. Here are some large lakes, skirted by remarkable woods."

Nothing could be more accurate than this description of Saometo as tallying with Crooked Island, and that it is that island I hope will presently be made clear.

"*Wednesday, October* 24.—At midnight I tripped anchor from the Cabo del Isleo to go to the island of Cuba, and the people showed me that I was to go to it by the W.S.W., and I sailed on that course until daybreak, when the wind fell and it rained till midday; and then it began to blow very hard, and the wind carried away all my sails—the mainsail and two topsails, the foresail, the staysail, the mizen, the topgallant sail—and the ship's boat; and at nightfall I was seven leagues off the Cabo Verde of the island Fernandina, which lay to the north-west, and as it still blew hard, and I did not know how far it was to Cuba, and in order not to fetch it at night because all the water round

these islands is deep, and no bottom could be found except at two gunshots off, I resolved to strike all the sails except the foresail, and to sail with it. The wind increasing, I made much way of which I was doubtful. I then ordered the foresail to be set, and that night we went two leagues.

"*Thursday, October* 25.—After sunrise, sailed W.S.W. till 9 o'clock, about five leagues, then changed the course to west. Sailed eight miles an hour till 1 P.M.; and from then till 3 o'clock about 44 miles. [They then saw land, seven or eight islands extending from north to south, at five leagues distance.]

"*Friday, October* 26.—Anchored five or six leagues to the south of them. The Indians said that thence to Cuba would take a day and a half in their canoes. Sailed thence for Cuba, which, from what the Indians say of its size and the gold and the pearls, I thought must be Cipango" (by which he meant Japan, so called by Marco Polo).

"*Saturday, October* 27.—At sunrise tripped anchor and left these islands, which I named 'Las Islas de Arena' (the 'Islands of Sand'). Went 8 miles an hour S.S.W. till one o'clock, making about 40 miles, and till night 28 miles on same course;" and before night they saw land.

They sailed this day till sunset 17 leagues S.S.W., and on Sunday the 28th October they entered a very beautiful river and harbour, to which the Admiral gave the name of San Salvador. They were then indubitably in the Island of Cuba, and now that I have led you briefly through the Diary to a point so distinctly recognisable as this, I am in a position to invite your attention to the different versions which have been applied to this track by the different disputants. As I have already intimated, four islands have been adopted by different commentators as the Guanahani, or San Salvador of Columbus; and I think I shall best save your time if I show the points at which their arguments fail, rather than lead you by a tedious process through all the grounds on which their respective claims are advanced. I do this on the principle that a chain is no stronger than its weakest link; and if it should be thought that in tracing a log so susceptible of misapprehension and misconstruction as that of Columbus this process would scarcely be sufficiently just, I congratulate myself on having found an impartial means of enabling the reader to judge for himself by a very simple mode of examination, which will at the same time free me from the charge of presumption in giving a verdict where men of such high renown have differed. In the first place, then, we find that for more than two hundred years the name of San Salvador has been applied on maps to Cat Island, and that this application has been defended by Washington Irving and, after him, by

Humboldt. First, then, let me remark, that whereas Columbus says that on the 12th October they reached a small island of the Lucayos, that description cannot well apply to Cat Island, which is 42 miles long; Columbus says that Guanahani was very flat, whereas the height of Cat Island varies from 200 to 400 feet, and it is the loftiest of the Bahamas, and although this part is confined to a ridge at the north-west extremity of the island, the fact of its existence would have precluded Columbus from saying, as he does say, that there was no hill in this island. In Cat Island there are no large salt ponds, whereas Columbus says that in the middle of the island there was a very large lake. In such facts as these there is, I think, enough to shut out the possibility of Cat Island being Guanahani, whereas all the data of Columbus are to be found exactly in Watling Island. With respect to the departure from Guanahani, Washington Irving says that Columbus does not mention the course which he steered. Literally, no: but he very distinctly states what course he had determined to steer, viz. the south-west, and that with a very cogent motive, viz. the search for gold, which the natives indicated was to be found in that direction. This course is entirely incompatible with Washington Irving's subsequent deductions. With such discrepancies at the outset, I think it is needless to weary you with fuller details of the illustrious American's ideas of the track of Columbus.

The next suggestion that is presented to us, is that which I have alluded to at the commencement as advanced by Navarrete, and somewhat blindly accepted by myself, under the circumstances I then mentioned, that Turk's Island was Columbus's Landfall. Now, it is quite true that Turk's Island contains several salt ponds which might be supposed to tally with the interior lake and many waters of Guanahani. It also has a reef surrounding it, as Guanahani had; but it has no harbour, the only open road being on the west side, and the shore is so bold that there is no anchorage except close to it. The unfrequented road of the Hawk's Nest, at the south end of the island, is even more dangerous; whereas, as I shall presently be able to demonstrate, Columbus anchored in safety at the south-east end of Guanahani. Again, Navarrete makes the Concepcion of Columbus to be the Gran Caico, and the next island that Columbus went to, and which he called Fernandina, was only nine leagues off, whereas the Little Inagua, which Navarrete takes for this island, is 22 leagues from Gran Caico. Columbus describes Fernandina as stretching 28 leagues south-east and north-west, whereas Little Inagua has at its greatest length but four leagues in a south-westerly direction; and, in fact, Fernandina has nothing in common with Little Inagua. These

facts are sufficient, I think, as items of detail, to preclude Turk's Island from the honour of being named San Salvador.

I purposely defer, for the present, the consideration of Captain Becher's advocacy of Watling Island, because I think I have conclusive arguments in its favour, and therefore leave it to the last, and proceed to examine the claims of His Excellency Senhor de Varnhagen in favour of the Island of Mayaguana. To start with: there is no large lake in the middle of the island, as in Guanahani, and this is so prominent a feature in Columbus's description that I regard it as indispensable to the identification of the island. Then, if Mayaguana were Guanahani, the next island which Columbus passed without giving it a name would be the Planas, which does not tally with the description of the nameless second island, and he would have sailed westward; whereas the Diary distinctly says that his determination was to sail south-west, to seek the gold and precious stones which the natives said were to be found in that direction; and if Acklin Island were Concepcion, as Senhor de Varnhagen suggests, it would be the third island alluded to by Columbus, whereas its form and coast-line would tally with that which he ascribes to the second, but not to the third; while there would be no apparent object for the anxious preparation made by Columbus for reaching before nightfall the west point of Saometo (which Senhor de Varnhagen thinks he took to be one with Acklin Island, and, consequently, part of Concepcion), because the eastern cape would fall first in his way. At the same time, the trending of the north side of the island, which he must have sailed along, does not tally with that ascribed by Columbus to Concepcion, which trended north-west and south-east, and, even if it did, the westernmost cape at which he anchored would be the same as that of which he afterwards speaks with excessive and enthusiastic admiration, as to its beauty and the perfume of its vegetation, but now is quite silent on the subject. I think these discrepancies render it needless to pursue these details further, as I shall presently present to you a more summary means of disproving this claim.

I will now, therefore, proceed to the consideration of the claims in favour of Watling Island, first stated freely and without detail by Muñoz in 1793, reasoned out in full by Captain Becher in 1856, and corroborated by the learned Professor Oscar Peschel, in Augsburg, in 1857. Now, there is not a single requirement in the description of Guanahani in the Diary which is not fully met by Watling Island,—the large lake in the centre, the N.N.E. trending of the southern portion of the eastern side of the island, the peninsula on that side enclosing a harbour of still water, which Columbus thought of

for a fort, and which could be readily converted into an island—while the form of Rum Cay, which lay in his south-west course from Guanahani, tallies exactly with his nameless second island. His course thence due west to the western point of Long Island agrees precisely with his anxiety to reach the western point of the island which he named Concepcion, the trending of the coast-line of which exactly tallies with that of Long Island. The distance of said westernmost cape to that part of Great Exuma Island, which he saw to the westward, corresponds well with the description of the Diary, while the subsequent route, as traced by Captain Becher, fits admirably with the description of the return track given by Columbus as far as Saometo, to which he gave the name of Isabella; and the subsequent passage to Cuba leaves no substantial reason to doubt that Saometo is identical with Crooked Island. But, as in this latter passage Columbus lost much of his dead reckoning under the pressure of foul weather, if any doubt remain upon this point, I trust it will be removed by evidence of a more summary kind which I propose presently to lay before you. But here I must pause to say that, while I believe that evidence will demonstrate to your satisfaction that the Guanahani of Columbus is Watling Island, I entirely disagree with Captain Becher as to the point where the Admiral first anchored off that island, and also as to his movements while there. Captain Becher, in his chart, indicates the anchorage of Columbus a little to the south of the north-east point of the island, and when he tripped his anchor, makes him sail round the northern end of the island. It is nowhere said in the Diary that he rounded the island. It is true that Columbus speaks of a ridge of stones encircling the island, but I submit that it is quite possible to use such an expression as an inference from what he saw, without himself sailing round the island, while the description of his actual movements precludes the latter idea. In fact, the remark was made when he went on an exploring expedition in the boats to visit the east coast for the first time. Captain Becher makes Columbus's ship follow the boats in which he made his reconnaissance. The Diary says nothing of the kind. What the Diary says is, that he took the ship's boat and the caravel's barges and went along the island, in a N.N.E. direction—"y fue al luengo de la isla en el camino del Nordnordeste, para ver la otra parte, (que era de la otra parte del Leste) que habia, y tambien para ver las poblaciones"—which I translate, "To see the other side of the island to the eastward, or on the east;" but which Captain Becher seems to think implied "to see that part of the island which was the other side from the east, namely, the west." I have consulted Spaniards as to their apprehension

of this expression, but I do not find one who assigns to it the meaning adopted by Captain Becher; but, in pursuance of this idea, my friend the Captain attributes to Columbus the aforesaid movements, which are not only unmentioned in the Diary, but are distinctly contrary to other statements which occur therein.

Now, as I am a landsman, and find myself in the position of disputing the conclusions of a distinguished naval officer of long standing, I must ask officers of the navy to correct me if I prove to be in error, or to express their assent to my conclusions if I should seem to them to be right.

Captain Becher, as I have stated, places the anchorage of Columbus a little south of the north-east point of Watling Island; and then concluding, from his own version of the Admiral's words, that he proposed to visit the west coast of the island, he not only makes the ships follow the boats—contrary to the language of the Diary, which makes the boats return to the ships—but he also makes the Admiral sail, of necessity, in a N.N.W. direction, while both the Diary and Captain Becher himself declare him to be sailing in a N.N.E. direction. But, further: when we follow the Admiral's movements with the boats, we find that from the anchorage assumed by Captain Becher, and in the course followed by the boats according to his view, they could not, if we consult Commander Barnett's 'Survey of Watling Island,' have met with anything in any sense corresponding with what Columbus describes himself as having found; no harbour with a narrow inlet, in which the water was as still as in the inside of a well, nor any peninsula which might in very short space be converted into an island. As an alternative, I beg you to revert with me to the original expression of Columbus. It runs thus:—"*October* 14.—At daybreak, I ordered the ship's boat and the caravel's barges to be manned, and I went along the island, in a N.N.E. direction, to see the other side of the island to the eastward." Now, if what seems to me the rightful rendering of the expression, "to see the other side of the island to the eastward" is corroborated by the judgment of my readers, it will be found that every detail of Columbus's description of what he saw on the island falls into its place with perfect congruity. I shall be glad to be corrected if I am wrong; but it seems to me clear that a visit to another side of the island to the eastward, by a N.N.E. course—the trending of the east side of the island being itself N.N.E—necessitates starting from a point on the south-east. If we suppose Columbus anchoring a little to the west of the south-eastern-most point of the island, and taking the boats to visit the other side, namely, the eastern, we find his N.N.E. course will bring

him to the narrow inlet of a large bay, skirted by a peninsula exactly such as he describes. After examining the bay, he returns, in accordance with the language of the Diary, to the ships; and, on leaving his original moorings for the second island, he would fall in with the islands to which he directed his course in a manner infinitely more in conformity with the details of the Diary, which we have already followed out, than he could have done in pursuing the course which Captain Becher, under the influence of conjecture or misapprehension, has made him take round the north of the island, and thence to the south-west. Thus we can understand how, in sailing from the anchorage I have indicated, and after keeping out all night, for fear of approaching the second island in the dark, from apprehension of shoals, he would describe the face of Rum Cay, which he first approached, as lying north and south, while the north side, which he coasted, was east and west, which tallies very fairly with the conformation of Rum Cay. Briefly, then, the matter stands thus: Columbus comes to his anchorage from the eastward. From that anchorage he passes in his boats along the eastern side of the island by a N.N.E. course. The topography of the part explored, which is described with remarkable minuteness by Columbus, corresponds exactly with the southern portion of that east coast, and that portion only; while the trending of that part of the coast is precisely N.N.E., in exact correspondence with the course indicated. The conclusion, therefore, seems to me unavoidable that his anchorage lay off the south coast, that is, sufficiently so to allow the east coast to be called "La otra parte;" that is, a part as yet unvisited, and sufficiently to the east to allow of the course being N.N.E.

If these arguments shall meet an approving verdict from naval officers, whose knowledge best enables them to decide the question, I shall have the satisfaction of being the first to indicate with accuracy the first anchorage of Columbus in the Western World.

I will now introduce to you my process of fixing the identity of Guanahani with Watling Island. In the accompanying diagram is a facsimile of a map of the Bahamas, published, in 1601, by Herrera, the official historiographer of the Indies in Spain, and laid down by him from the original documents in the handwriting of Columbus and his contemporaries, which, in his official position, he had under his special charge. Side by side with it is a map, copied from the Admiralty Survey, showing those islands as now known and with their modern names; and I venture to hope that you will agree with me in the identification of the respective islands laid down in the old map

with those which I have set forth as their correlatives in the modern one; and, if so, the Guanahani of Columbus will be plainly seen to be Watling Island.* But as the accuracy of this identification involves the whole question at issue, I beg to call your special attention to the following facts. Out of twenty-four islands brought under comparison (I include Cuba and Hispaniola, on account of their indisputable position and nomenclature), ten retain in the modern map the same names as they held in the old; thus affording stations for comparison which reduce the chances of error to a minimum. Happily, this coincidence of names in the old and new maps ranges impartially over the whole group, embracing the Great Bahama, in the extreme north-west, and Tortuga, Cuba, and Hispaniola in the extreme south. The relative bearings of these ten islands almost force us into accuracy of identification of the remainder. The illustrious Humboldt thought that the map made in 1500, by the pilot Juan de la Cosa, who was with Columbus in his second voyage, 1493–96, confirmed the claim of Cat Island to be the true Guanahani. I cannot but think that if the great philosopher had happened to collate De la Cosa's map with that of Herrera now before you, he must have come to a different conclusion. Herrera's map embodies all the information contained in De la Cosa's, but has the advantage over the latter in having been made a century later, and so contains the entire chain of islands, many of which had not been explored in 1500. It will be observed that one of the ten islands whose names are identical in the two accompanying maps is Senhor de Varnhagen's Mayaguana itself, which is represented, *together with* the island of Guanahani, both on De la Cosa's and Herrera's maps; so that I regret to say that His Excellency seems to me to be *ipso facto* put out of court, since no reasoning whatever could by any possibility make identical two islands so markedly distinct that several other islands are

* HERRERA.	MODERN.
Bahama	Great Bahama Island.
Bimini } Habacoa }	Andros Island.
Cabeça de los Martires } ..	Cay Sal Bank.
Yucayoneque ..	Great Abaco Island.
Cigateo	Eleuthera.
Curateo	Little S. Salvador.
Guanima	S. Salvador, or Cat Island.
Anonymous between Habacoa and Yuma .. }	Great Exuma.
Guanahani	Watling Island.

HERRERA.	MODERN.
Yuma	Yuma.
Samana	Samana.
Xumeto	Crooked Island.
Yabaque	Acklin Island.
Mayaguana	Mariguana.
Caycos } Amana }	The Caycos Group.
Canciba	Turk's Island.
Abreojo	Mouchoir Carré.
Canaman	Silver Plate Bank.
Macarey	Navidad, or Ship B.
Mira por vos ..	Miraporvos.
Ynagua	Great Inagua.
La Tortuga	Tortuga.

shown to lie between them. Senhor de Varnhagen published last year a fragment of a map made by Alonzo de Santa Cruz, cosmographer to Charles V., in confirmation of his theory. Curiously enough, that map does not expose the fatal fact to which I have just drawn attention, because it does not extend sufficiently far south to include Mayaguana; but as, so far as it does go, it corresponds entirely with Herrera's map, there is no room to doubt that, if extended, it would have exhibited the same realities. Nevertheless, in this fractional map, whose limits *could* not take in Mayaguana at all in its rightful geographical position, my friend Senhor de Varnhagen finds a Guanahani to the south-east of Guanima; and, taking it for granted that Guanima is Watling Island, he comes to the conclusion that Guanahani is his own Mayaguana. *En passant*, he remarks that Guanima is represented as too large for Watling Island. Of course, it is too large; because my friend has fallen into a mistake in his identification of this island. Guanima is not Watling Island, but Cat Island, which is, indeed, a large island, 42 miles in length; and Guanahani, or Watling Island, is, as Columbus described it, an isleta, or little island; while Cigateo, which my friend takes to be Cat Island, is Eleuthera. I cannot here help drawing attention to the fact that antagonism to the foregone conclusions of others has proved the rock upon which the reasoning of each of these distinguished disputants has split. Navarrete will not accept Muñoz, and Gibbs follows in the same groove. Washington Irving relies upon Slidell Mackenzie's examination of the route of Columbus, which was mainly addressed to the disproval of Navarrete's Turk's Island. Humboldt follows in the same track, and thinks Mackenzie's conclusions confirmed by Juan de la Cosa's map; a glance at which will show that, unless assisted by a comparison with later maps, its imperfect representation of the Bahama group is quite inadequate to the settlement of so minute a question. But, in truth, the illustrious philosopher's attention was not directed to a discrimination between Cat Island and Watling Island for the true Landfall, but to the disproval of Turk's Island. Senhor de Varnhagen excludes Watling Island from the field by the use of fragmentary evidence; and, having once applied to that island a name which did not belong to it, fell naturally into the erroneous conclusions to which a false step must lead. I conceive that a safer mode of avoiding all these pitfalls cannot be resorted to than that which I have submitted to your attention, viz., reference to an authoritative map, based on Columbian documents, constructed before any question was raised on the point in dispute, new enough to contain all the islands in their approximately

correct position, but old enough to contain not only the name of Guanahani, but a large proportion of ancient names identical with those at present existing, and thus rendering an accurate identification of the remainder an almost inevitable consequence.

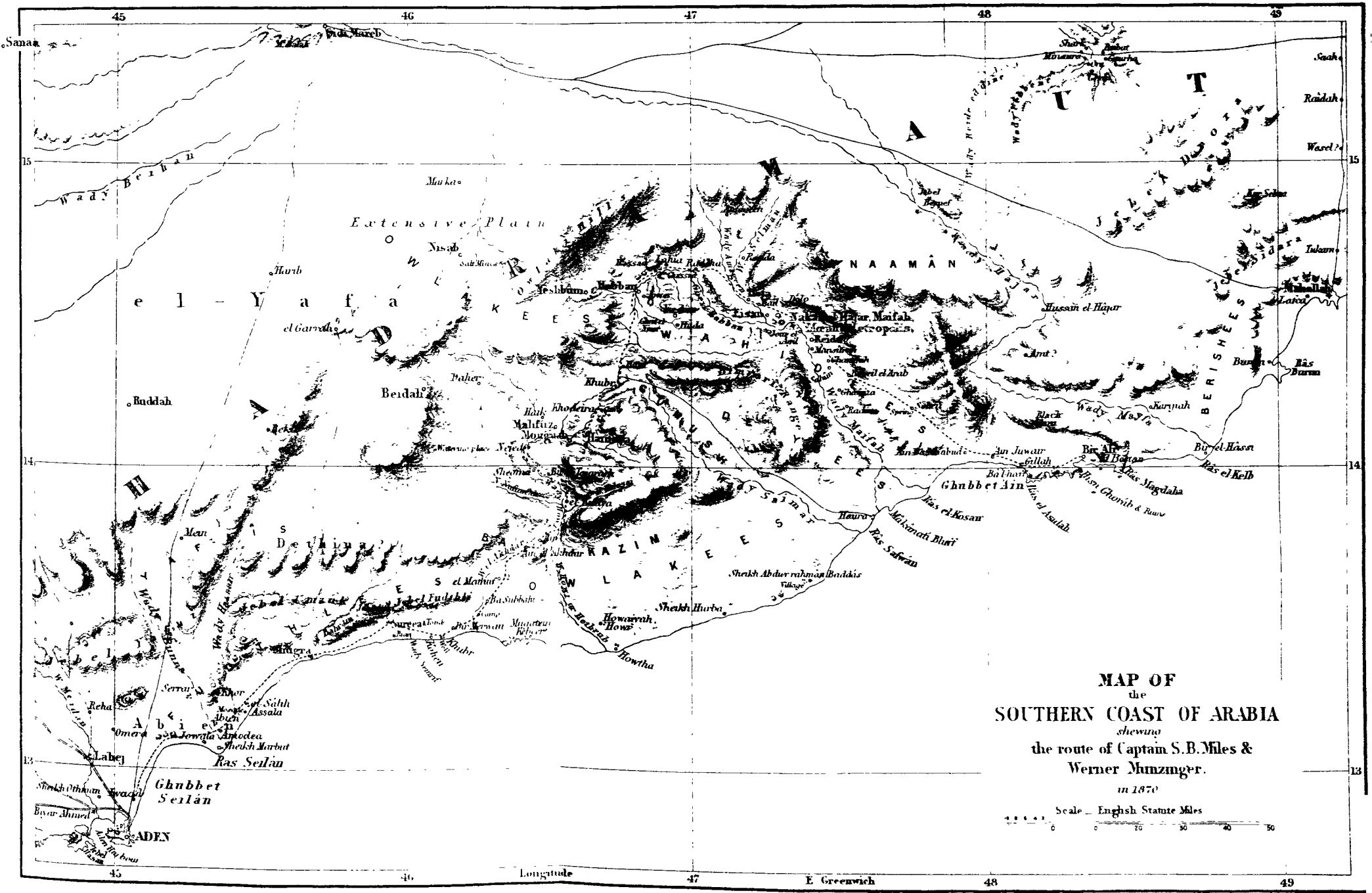
VIII.—*Account of an Excursion into the Interior of Southern Arabia.* By Captain S. B. MILES, Bombay Staff Corps, and M. WERNER MUNZINGER, C.B., Hon. Corr. Mem. R.G.S.

Read June 12, 1871.

DURING my residence in Aden I had often longed to visit some part of the neighbouring country of Yemen, our knowledge of which, deeply interesting as it is in many points of view, is so extremely limited. I was glad, therefore, to avail myself of a few days' leave in July last to make a short trip into the interior, in company with M. Werner Munzinger, who happened to be staying in Aden at the time. The notes of this trip I beg to offer to the Geographical Society.

The route we proposed to take was from Aden to Hisn-Ghorāb by sea, and thence to Nakab-el-Hājar, Habban, and Nisab, the chief town of the upper Owlakee. I was the more anxious to visit this part of the country from the hopes I entertained of finding Himyaritic inscriptions, which were said to exist at Habban and other places on our route.

We left Aden on the 3rd July, 1870, at 8 P.M., in a small sumbook, and after a tedious voyage of four days, during which we experienced a succession of calms and light breezes, arrived at Hisn-Ghorāb on Thursday the 7th, at 5 P.M. We landed at Bir-Ali, where we found the Wahidee Sultan, Hadi Abdulla, then residing. He seemed rather surprised to see us, but received us in a very friendly manner, and gave us accommodation in his house. We found we should be delayed here three days before we could start, as, the Sultan having no camels, they would have to be procured from the neighbouring tribe of Deaybees, who would also furnish the escort for our protection. The delay was annoying, but Sultan Hadi sent off a messenger at once, and with this we were obliged to be content. The village, which takes its name from the well Bir-Ali, consists of about fifty mat huts close to the sea, in one of which Sultan Hadi resides. The only permanent buildings are a square tower, and a few Sheikhs' tombs. The tower was built four years ago on the ruins of a former one, and Hadi hinted he had already found occasion for its use during internal dissensions. The country around is quite barren and devoid of cultivation, being



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all sand and rock as far as the hills, which rise about ten miles off. The inhabitants are mostly employed in fishing, and are very poor. The chief product of the country is dates, which are exported to Aden and Makallah. Jowaree, bajree, and a little indigo are also cultivated further inland, but not sufficient for consumption. No coffee whatever is grown. Anthracite is found here, and specimens are sometimes brought to Aden as coal; there were signs of copper also, and bitumen is found in abundance.

Sultan Hadi is an intelligent, fine-looking man of about forty-five. He has been to Aden and India, and was expecting the return of a Turkish steamer, intending to pay a visit to Egypt. His ruling passion is avarice, *the* vice of the Arab. He owns one bugla and some extensive date groves, but few or no camels or flocks. His chief residence is at Râs Magdaha, from whence the dates are chiefly exported. His rule does not extend over the whole Wahidee territory, but is divided with other members of the family. The harbour is a small, circular, and safe bay, one mile long by one and a half broad, exposed, however, to the south winds. On the north shore is situated Bir-Ali; to the east, near the entrance, is a curious hill named Shāaron (but generally referred to by the Arabs as "El Bostān," from a supposition that it was in ancient times a garden), having a large cavity or crater, full of salt water, bordered by mangrove bushes; to the south of the bay is a narrow strip of land extending from the west point half-way across the entrance. From this rises Hisn-Ghorāb—a square, black, solitary rock—placed (a perfect natural fortress) as if purposely intended to guard the entrance of the bay. The upper part of the sides of this gloomy-looking hill is as steep and inaccessible as if artificially scarped. At the foot of it, on the north side, are the foundations and remains of a considerable town, almost buried in the sand. The houses were built of the black basaltic rock of which the hill is chiefly composed, and appear to have been of small size. We could see no architectural remains. The public buildings were probably situated on the top of Hisn-Ghorāb.

The next day we paid a visit to Hisn-Ghorāb, which was reached after a walk of a mile and a half along the beach. The road leading to the summit was in a most ruinous state, and very difficult of ascent. The Arabs said it had been much injured by late floods. The formation of this hill is curious, and consists of a great variety of rocks; sandstone, limestone, basalt, trap, and clayslate; the volcanic rock is more on the west side, and the sandstone on the east; the lower part is basalt. Shells were found up to the top. There did not appear to be any

plutonic rock. The formation, altogether, is very similar to that of Aden. The ruins on the top have already been fully examined and described. The foundations and part of the walls of the houses are still standing, but the only building of any pretensions is on the highest point to the west, and was probably the residence of the king or governor; it is the only one I noticed cemented with mortar. The tanks and aqueduct are still in excellent preservation, considering their age. We paid a second visit to Hisn-Ghorāb for the purpose of copying the inscriptions, which we did with much care. The letters, however, are neither deeply cut nor very even, and, from the stone being considerably weather-worn, are not so clear and distinct as might be wished. The largest inscription is 50 inches by 23 inches. We heard to-day that the ruins at Hagar, a place about four days' journey to the north-east, on the wady Maifah (مبغاء), were nearly as extensive as those at Nakab-el-Hājar, and that there were certainly inscriptions there. It lay, however, too much out of our route for us to think of paying it a visit.

Sunday, 10th.—This morning the party of Deaybees who were to escort us on our journey arrived with the camels, and an arrangement was soon made with them for us by Sultan Hadi. They at first refused to go further than Reida, but agreed ultimately to take us as far as Hota. Hadi had promised us to write to the Sheikh of that town and inform him of our coming. This, however, he neglected to do, and our sudden appearance there subsequently, rather startled the suspicious but simple minds of the inhabitants, and caused us some little difficulty. Our party consisted of five, viz., Lallāh Ahmed El Azaibee (an Arab attached to the Aden Residency, and our factotum), two servants, an Indian and an Abyssinian, and ourselves. The escort numbered seven matchlocks of the Ahil Abdulla, the chief clan of the Deaybees, and one man sent by Sultan Hadi; altogether, thirteen persons. At 2.15 P.M. we mounted and commenced our journey. After passing two small wadies, Kudām and Nowājir, we gradually ascended a low plateau, 300 to 400 feet high, intersected by numerous nullahs running south. About half-way was a hill to our left called Jebel Fursh, and near it a large well-wooded and grassy nullah of the same name. The plateau is composed apparently of clay and limestone, which crops out in several places, and is covered with boulders, of sand and broken lava, interspersed with scant herbage. On the road we were passed by a man hurrying on in great alarm, being pursued for his life, as he told us, by some men on account of a blood feud in his tribe, and he was endeavouring to reach Makallah, where he thought he would be safe. His meeting

with us, however, was a fortunate circumstance for him, for about a mile further on we came across his pursuers, and our escort forced them to give up their intention for the present and turn back with us, which, after some show of opposition, they eventually did. The Arabs in this part of the country have the savage practice of never accepting the "deeat." Blood can be atoned for only by blood. This, however, is not without its advantages, for it enhances the value of a life by its reflective action, and is the only restraint on their unthinking violence. At 8.30 P.M. we halted and camped for the night in a hollow among the sandhills. Our general direction had been west, but varied from N.W. to W.S.W.; distance, 19 miles.

Monday, 11th.—By 4 A.M. we were again on our journey, and our road now led over a waving sea of loose sand dotted with bushes, and here and there a few sumar, nabak, and sidr trees; we passed also a belt of wild date-palms laden with their small tasteless fruit, which is called here Pamar el louz. At 6 A.M. we came to the village of 'Ain Juwair,* situated near a wooded and fragrant nullah; we noticed a few lemon-trees growing here. No game whatever is to be seen in these parts except, rarely, a gazelle or two. Feathered songsters, especially the crested lark, were however very numerous, and their melody to me was very pleasant after the bird-silence of Aden I had been accustomed to so long. At 8.20 A.M. we arrived at Ain-ba-Māabúd, the camels much fatigued by toiling through the heavy sand. Ain is merely a small fishing hamlet surrounded by a date grove; the dates are of a very fine kind, with small stones. Here many of the Bedouins came to see us, probably not having before seen a European. They endeavoured to pick a quarrel with our Deaybees for bringing us into their country; this was, however, I suspect, partly out of jealousy and a desire to share in what could be got out of us, the Bedouins looking upon a traveller, especially a European, as the coast tribes look upon a wreck, viz. as one of God's best gifts to be made the most of. Our guides were now very anxious we should travel only at night, to avoid the demands that would be made upon them on the road wherever we were seen by the people. This would hardly have accorded with our object, and we therefore declined. I believe, too, they were partly actuated by shame at being seen in our company. We saw a few of the women here; they go about freely, and like the generality of Bedouins are coarse and ugly creatures, ornamented with beads and copper anklets. We were told of frankincense trees growing on the Himyari

* This is perhaps the Ain Jowari of Wellsted, but it is much further from the sea than he makes it.

hills; curiously enough, however, the gum is gathered, not by the natives, but by Somalies, who come across for the purpose, and pay, of course, for the privilege. It is the same case, also, near Moculla, the Arabs themselves either not caring to be at the trouble, or not understanding the process. The water at Ain-ba-Máabūd is scarce, but good. Distance 11 miles. At 6 P.M. we continued our journey over the sandy wilderness, the hills rising on our right and in front like a barrier. At 6.30 P.M. we passed a ruined mud fort on our right, and soon after the open sea, distant some 7 miles, came in view. Lying to the west of us was another hamlet named Ain-ba-Máabūd, about 5 miles off. The tombs of two famous saints, father and son, were at these places. After a tiresome march we were glad to halt and camp among the "kouād" or sand hills at 9.15 P.M. Direction W.N.W.

Tuesday, 12th.—Started at 5.30 A.M., and still traversing the endless undulating sands, at 7.15 A.M. we arrived at Soheil (سحايل), a low hill, on the top of which was a spring gushing out from a limestone basin shaded by wild date and sidr trees, the water flowed but a little way, irrigating a small patch of wild cress, and was then lost in the sand; near, was a grassy knoll, and the numerous bushes and trees around, made it quite a pleasant and refreshing little oasis in the dreary desert. The spring was greatly resorted to by the feathered tribe, among which doves and the beautiful sand grouse abounded. The heat here was intense, and we were obliged to pitch our tent, for the shade of an acacia is a very ineffective protection against the scorching rays of a desert sun. The hill appeared to be principally of sandstone; flint and marble were also present. The water was warm, and had a slightly mineral but not unpleasant taste. The country in which Soheil is situate is an extensive undulating plain rather than a valley, having the usual desert vegetation of scrub and acacias, and bounded by the high ranges of the Himyari hills to the west and north-west, and another far distant range to the north. Our escort of "Wolves" (Deaybees) had by this time become great friends with us, and were ever ready to assist and please. They were merry and talkative, but not communicative regarding their country, and, if questioned much, became sulky and suspicious. They gloried in the name of Himyar, and boasted of their direct descent from that race, whose language they still retain; and certainly not without reason when we contrast the deeds of those heroes with the present degenerate state of the Arabs. They promise to bring us to Nakab-el-Hājar by to-morrow morning. In the afternoon, by 3.30 P.M., we are again on our camels travelling

due west; the country generally open and sandy, but varied here and there with sterile, stony tracts. We came across a few gazelles on our road, they were very wild, as every Arab that passes thinks it his duty to level his matchlock at them, possibly in the faint hope of hitting one. The hills here were remarkable for the strong resemblance the crests bore in their general outline to an artificial fortress. After a slight descent towards the wady we camp for the night under a hill in a hollow named Howeil-el-Arab (حويل الرب) at 7.30 P.M. No water.

Wednesday, 13th.—Having a long march before us we resumed our journey at 12 A.M., our direction changing to north and north-west. Very soon we heard the pattering of musketry, which continued for some time, but we did not pass near enough to see the fight or meet any of the combatants. Such contests are of frequent occurrence in these parts, but there is seldom much harm done. The country now became much improved, trees were numerous, and we soon came in sight of the villages and cultivation. At 5 P.M. we came to the town of Reida, but our escort having a blood feud with the inhabitants, we were obliged to pass by without entering it. Soon after, the fortress of Nakab-el-Hājar appeared in view, situated on a commanding eminence on the right bank of the wady, here half a mile or more broad, and at 5.45 P.M., having unloaded the camels near a large house or castle opposite, and obtained permission and a guide from the Sheikh, we started at once to visit the ruins. We spent several delightful hours in exploring them and rambling about in search of inscriptions, and returned at last full of wonder at what we had seen, and feeling well repaid, so far at least, for our journey and trouble. These remains have been so ably and fully described by our intelligent predecessor, Lieut. Wellsted, that any attempt of the kind on my part would be, to say the least, needless. Well, however, as he has performed his task, I confess I was scarcely prepared for the real grandeur and extent of the place; it is, in truth, a marvellous work, and is a significant proof of the character of the dynasty in which it was erected. Some of the blocks of stone are of enormous size, and the labour spent in raising them must have been very great, the exactness and beauty also of the masonry of the building at the south end excited our surprise and admiration; no mortar has been used in its construction, and, like the old Etruscan walls in Italy, the outward front only has been smoothed. Though little more now remains than the dilapidated exterior wall, Maifah is a noble monument of the laborious vigour of a former age, and must in its palmy days have been an almost impregnable fortress,

well calculated to be an emporium of that rich and extensive commerce between the east and west, of which the wady Maifah has been from the earliest times one of the principal channels as the numerous remains at Kedūr, Eisan, Radéha, Hisn-Ghorab, and perchance others, testifying to the wealth of this part of the country, and its large population, sufficiently show. Its former importance, too, is apparent enough from the designation given it by Ptolemy, with whose Mœpha Metropolis its identity may be considered as established. The inscription over the entrance was soon found and carefully copied; but, being at a considerable height above the ground, we should have had great difficulty in reading it clearly, had not the Arabs, who accompanied us, very good-naturedly assisted us to pile up stones to stand on. Two other inscriptions were found, but they were almost illegible, from the stones on which they are cut having become decayed.

We had been less fortunate than former travellers, in coming through a desert country out of the line of the villages and cultivation they passed through, but what little cultivation we saw appeared to be excellent, the fields being more regularly marked out and ploughed than those in the vicinity of Aden. Jowaree, bajree, and tahef are principally grown, besides dates. In Jour-el-Sheikh, and some other villages, cloth is manufactured. The people, however, appear to fare badly, owing probably to the chronic state of disturbance in which the country, containing many different clans or families, is said to be involved. The people at Nakab-el-Hājar were very civil and well-disposed towards us, and though many of them came to pay a visit and have a chat, no one attempted to annoy or disturb us in any way. The distance we had come from Ain was about forty-three miles, and our elevation above sea level was 1500 feet. Two miles to the east, a serrated range of hills, their bases aproned with sand, rose to 1000 feet above us, and to the west the Himyari range, rising perhaps 2000 feet, appeared some five miles distant. The town of Eisan was visible from Nakab-el-Hājar, lying about six miles to the north-west. It is said to be built within the ruined walls of a fortress like Nakab-el-Hājar, but on a smaller scale. We could not hear of any inscriptions there.

Besides the one we came by, we heard of another road from Bir Ali, crossing the eastern or Dolo range of hills, but though shorter, it was said to be rugged and impassable for camels. The water at Nakab-el-Hājar was not good, and had an unpleasant and mawkish taste.

By 4 P.M., having finished our observations, we mounted and continued our journey towards Hota. Leaving the wady, which here makes a curve to the west, we passed, after half an hour, a

small solitary hill to our left, and proceeded in a W.N.W. direction over a bare level country. While jogging on we were passed by two men on camels, posting on to Hota with the intelligence of the skirmish of the preceding night, in which two of the Deaybee tribe had been slain. They seemed not a little surprised at our appearance, and their looks and remarks boded us no good. Our factotum, Lallāh, was vexed and apprehensive at the inauspicious rencontre, and, as it afterwards appeared, not without reason, for it was by their insinuations and reports that the fanatical folks of Hota were stirred up to oppose our entry. After descending a steep sandy declivity, leading to a rocky defile, we again came upon the wady, and passing on our right the village of Kail, picturesquely situated at a height of 300 feet on a spur of the hill, we entered its stony bed, in which were pools of water and extensive date-groves, and soon after came in view of the cultivation and suburban houses of the town. We had not proceeded far when we noticed the people gathering together on the banks opposite, and fast increasing in numbers, evidently much excited. On our nearing them we were saluted with a shout from the multitude of "Who are you, and what want you here?" "Khulk Allah," creatures of God, replied our escort, simply, lighting their matchlocks. The answer came they would not allow Kafirs to set foot in their country, and demanded to know why we had been brought there to disturb them; at the same time a number of the foremost rushed forward and stopped the camels, angrily motioning us back. The position was awkward, as the people were rapidly working themselves up into fury, when a tall old man suddenly came forward, pushed the others back, and conjured them in the name of God and the Prophet to remain quiet while he and the other graybeards decided what was to be done. A parley was then held between the elders and our escort, and, after a long and excited discussion, it was arranged that we should continue our journey on to Hota, and obtain the Sheikh's decision and orders on the subject. During all this time we remained quietly seated on our camels, taking no part in the discussion, but watching events, and determined not to turn back unless forcibly compelled. Our Deaybees behaved admirably; their resolute bearing and determination alone, I believe, carried us through. Their evident readiness to fight for us, should need be, had its effect on the people, disposing them to give ear to the old man's remonstrances. I was not sorry when we moved on again, but we had to submit to repeated halts for the discussion to be renewed.

Our path, through thickly planted date-trees, led us for about 2 miles farther along the wady, here banked for the most

part by a wall of loose stones, the hills being crowned on both sides with numerous houses, until we arrived at the town itself. We passed through it and reached the inner extremity before halting. It was now quite dark, and though we were glad enough to alight, we were totally at a loss what to do in this inhospitable place, for our escort were as much strangers as ourselves. We had sent to the Sheikh to inform him of our arrival, and we now received a message to say we were welcome, and should have protection as long as we liked to stay; but he had no power beyond the town, and could do nothing to forward us on our journey. No attempt at an offer of accommodation, or assistance in obtaining it was made. We were preparing to make the best of it, and spread our carpets on the ground, when we heard that Salib Ahmed, the son of the Sultan of Habban, was in the town. Lallah was despatched to him at once, and before long he came out and conducted us to his house. Here, after ascending the narrow dark stairs for six or seven stories, we were shown into one of the snug little partitions on the roof, where we took up our quarters, and though hungry and supperless, made ourselves as comfortable as we could for the night. Early the next morning we descended to the khawah, or reception-room, and were visited during the entire day by an unbroken succession of visitors. I am sure half the town must have presented themselves. It was exceedingly unpleasant. The women, too, with the curiosity of their sex, peeped at us through the windows of the adjoining houses. Our host's hospitality did not extend even to a cup of coffee, but this would have been nothing had we not experienced the greatest difficulty in procuring things by purchase. Half the day passed before we could obtain breakfast, and even then they made a favour of demanding exorbitant rates for their supplies. Our Deaybee friends took their departure to-day, much to our regret. They had behaved exceedingly well to us, and on no occasion had we found cause to be dissatisfied with their conduct in any way. We tried to induce them to take us on to Habban, but without avail; they said they had come as far as they dared. As we had no inducement to remain in this town longer than necessary, we tried our best to push on to-day, but were unsuccessful. We found it would be necessary to send to Habban for an escort to protect us from the Bedouins on the road, which would delay us some days. There was no help for it but to get a letter written and despatched to Sultan Ahmed at once, and wait for the reply. Sultan Salib, Kasir of Eisan, who divides the rule of the Wahidee tribe with Sultans Hadi and Ahmed, was also staying here. We did not see him, but he sent friendly messages to us, and he afforded us assistance in getting camels afterwards. He is the

maternal uncle of our host Salib Ahmed, and is said to be a sensible man, and much respected by his people.

Friday, 15*th*.—We were treated much better to-day, getting a separate room, and supplies being more readily forthcoming. We were still annoyed, however, by the incessant intrusion of visitors, whose remarks were not always very polite. They examined our things with much curiosity, and a snider rifle was a source of boundless astonishment and admiration. Their ignorance sometimes was rather amusing. One asked us whether we eat sheep, fowls, &c., mistaking us probably for Banyans. Another individual was impressed with the belief that the Sultan of Lahej and the Sultan of Turkey were one and the same person. The Sheikh to-day, in answer to a remonstrance from us, sent to express his regret at the want of courtesy with which we had been treated, said he had had no information from Sultan Hadi of our coming, and that therefore the blame was his (Hadi's) for not having written; that it was the business of Salib Ahmed, as he was here, to receive and entertain us, and offered to do all in his power to forward us on our journey. We were told of numerous inscriptions at Habban and at some places on our road, also at Kail, close by, but on reference to the Sheikh he said there were only the remains of an aqueduct on the hill. The ruins at Kedūr were also described to us, and were declared to be as extensive as Nakab-el-Hājar, from which they lie distant about 10 miles to the west. Sultan Salib Ahmed is a fine handsome-looking youth of 22 years, intelligent, and with good manners, but I should say grasping and insincere. He showed considerable interest and anxiety as to Sultan Hadi's negotiations with the Turks, and enquired whether they would return to Bir-Ali. An answer arrived this evening from the Sultan of Habban inviting us there, and with it an escort of Bedouins, but as they were of use only for the latter part of the journey, we had to obtain others also from the Sheikh.

The next day, Saturday, after a vain attempt to get off in the morning, they declared they would be ready to depart in the afternoon. It was arranged that Salib Ahmed should accompany us to Habban, and we had made an agreement with a Shereef of Amageen, named Ali Ahmed, to come with us to Aden, he being, as we heard, well-known to the Bedouins on the road. This man at first appeared very friendly, and answered our questions unreservedly, and we really thought we had found a "treasure;" but after leaving Habban he changed completely, and caused us continual annoyance and anxiety during the latter part of our journey. At 3.15 P.M., having sent forward our camels, we left Hota on foot. The people were quiet enough

now, but the roads were lined with men and the windows full of curious faces. A large crowd followed for some distance, but no one attempted to molest us. Our route lay west along the bed of the wady Amageen, which runs between two ranges of tabular-formed hills, that on our right turning off abruptly after a few miles. After proceeding 5 miles we came upon some Himyaritic inscriptions cut in the sandstone rock forming the bank, which we copied, and a mile further on we passed a large nullah to our right, named Selmān. On this we heard was situated the town of Randa, inhabited by Haik, an outcast and despised race. The wady here gets broader, and there is more underwood, with a few acacia and nabak trees. We now leave the wady and follow a small nullah over the hills to the left, arriving, after crossing a small plateau, at the village of Radēha, on the Gheil Habban, the steep rugged bed of which we had to descend. This was no easy or pleasant matter, either for ourselves or camels, as it was now quite dark. I was annoyed with the Arabs for not informing us of it, and arranging to start earlier so as to pass it during daylight; the camels to my surprise, however, managed to work their way down without a fall. We did not halt at the village, which was populous and surrounded with cultivation, but waded up the strong current of the stream for about two miles further, when we camped at 9 P.M. in a date grove, under the shelter of a high sandstone cliff of 300 feet or 400 feet. The stream is a perpetual one, fed by numerous springs, and, with its border of reeds, fragrant shrubs, and tall palms, was by far the most delightful and interesting spot we had yet seen. Our fire was a large one that night, for it was rather chilly, probably from the proximity of the water, and we had a difficulty in keeping ourselves warm.

Sunday, 17th.—At 4 A.M. resumed our journey up the nullah, which now widened considerably; the country, too, began to appear much more open, though still hilly. We passed a few villages on the way, at a short distance beyond one of which, Lahīa, we camped at 6 A.M. under a large shady nabak tree. The plains here are better wooded and the trees larger than any we have yet met with. The change in our camels and escort is decidedly for the worse. The Hota camels are miserable creatures, and their owners not much better; the Deaybees and their beautiful animals have, I am afraid, spoilt us in this respect. The chief of Kedūr came to pay us a visit during our halt here; he was very sociable, and invited us to visit him, offering any assistance in his power. He is almost the first Sheikh who has come forward in a really friendly manner to make our acquaintance. He described the ruins at Kedūr as very extensive, but had noticed no inscriptions on them, he said.

Kedūr is distant about 6 miles from Lahīa. In front of us to the north and north-west, lay two very conspicuous hills, named Hassad and Ghassad, whose formation, like that of the other hill ranges in this district, is somewhat peculiar, having a horizontal crest with perpendicular sides, formed by the decomposition of the rock from above. There is little cultivation to be seen about here, the whole surface of the country, in fact, is too hilly to allow much space for it, but it appears to be well watered. We heard here of the remains at Radēha, which we had unfortunately passed in the night. The accounts of the place leave little doubt of there being inscriptions there. Radēha is probably another of the fortified trade depots or stations on the great caravan road between Sanaa and the north. Started again at noon, travelling still in the sandy bed of the nullah, which gradually became broader, with much thick underwood in it. Here we again came across some inscriptions, Himyar, Hebrew, and Arabic, rudely cut in the sandstone bank of the nullah, the soft smooth surface of which has offered a tempting field for both ancients and moderns to scribble on. The country now commenced to open out into an extensive hilly plain, containing many Bedouin houses, the inhabitants of which greeted us very civilly, saying they wanted no dogs of Kafirs in their country, and promising very kindly to hang with one rope the next batch of Christians that came that way.

On approaching Habban, we were met by a party of the Sultan's men, who escorted us to the town, where the Sultan received us ceremoniously with a procession, Metatāh, and conducted us under a heavy fire from an old Turkish cannon half buried in the mud in the palace courtyard to the khawah, or reception room, where we had kishr, compliments, and conversation until we retired. Sultan Ahmed is a tall good-looking man of fifty, with quiet gentlemanly manners, and without any stiff pride about him. He was most courteous and hospitable to us during our stay, personally seeing after our comforts, and frequently bringing us things himself. At night we were visited by a severe sand-storm with rain, which drove us down from the housetop.

Monday, 18th.—In the morning we visited the inscriptions at Shegeb, a place belonging to the Bedouins, and beyond the Sultan's limits, though within a few hundred yards of the town. On the way to it we passed through a subterranean passage, about 150 yards long and 7 feet high, apparently excavated artificially for the purpose of bringing water from the nullah for storage. It is called Nakab-el-Khureef. Shegeb we found to be a low, flat hill, deeply intersected by wadies with high and steep banks; its formation is composite, but sandstone

greatly predominates. The inscriptions are on both banks, high up and low down, and are very numerous ; the whole of them, with a very few Arabic and Himyaritic exceptions, are Hebrew ; they are roughly and not very legibly or deeply cut. We copied a few only. The Himyaritic are still more irregularly carved, and appear also to be the work of the Jews, some of the words being composed of both Himyar and Hebrew letters. On the top of Shegeb are the ruins of a tower built by Sultan Abdul Wahid ; there is also a large oval cistern about 70 feet by 8, built with large stones, and of extreme neatness of execution, intended apparently for some manufacturing process ; perhaps a dye trough. A Kafila came in to-day from Aden, but as it had left the same day as ourselves we were disappointed in obtaining news ; it had travelled very slowly.

Tuesday, 19th.—Visited Shaab, but found there only one short Hebrew inscription and a few Himyaritic letters. We were then taken to Kethra, a high sandstone rock, but here there was only one Himyar word. We were greatly disappointed, as this was our last hope of finding any on our journey. To-day we had a visit from Shereef Ali, who has just arrived in the Kafila from Aden ; he is one of the most influential men of the town : he offered to procure us camels to Aden, and provide an escort, which we accepted, as we had hitherto found no one to assist us, the Sultan's limit not extending much beyond the town to the west and south-west.

In the afternoon we had a thunderstorm and a smart shower of rain ; none had fallen here for a long time, and it had been eagerly watched for, as the growth of the crops had been much retarded in consequence, and some of the fields had not yet even been sown ; the fall, therefore, caused great rejoicings ; and the Sultan was highly delighted. The quantity that fell here was evidently much exceeded by that on the hills, and the torrent soon came down, irrigating the fields as it approached, and followed by a crowd of people whose very existence almost depended on it. The thermometer ran down to 68° Fahr. I had heard at Aden of a large and noted private library in this town, and was of course anxious to get a sight of it, especially as a copy of the great history of Aden, of Tayib, Ba Makhrumah was said to be one of its treasures, the owner or keeper was, however, absent on a journey, and the house being locked up, we were unable unfortunately to gain admittance.

Wednesday, 20th.—The project of pushing on to Nisab and Datheena, we find ourselves, though most reluctantly, compelled through pressure of time to relinquish. It would take at least another month ; and our journey having already

been prolonged beyond what we had expected, we are both anxious to return as soon as possible. There has been great difficulty in procuring camels from the Bedouins, and Lallāh's negotiations with them have failed. Shereef Ali has, however, offered his own as far as Mongaah, where we shall be able to procure others, and proposes to accompany us himself. We agree to his terms and start to-morrow morning. In the evening we expressed to the Sultan our thanks and appreciation of his friendly feeling and hospitality to us, and distributed a few presents, which appeared to please and gratify.

Thursday, 21*st*.—At 8 A.M. we set forth from Habban on our homeward route. Travelling at first along the wady through Shegeb, we soon leave it for a very broken and difficult road, which leads us to another wady full of pools of water, opposite the hill range of Gheit-el-Nimr, so called from its being infested with leopards. This we follow for some distance, when we halt for an hour in the shade of a rock for breakfast. Our road now led south over extremely rough and broken country, the rocks here presenting an extraordinary appearance from the many different strata, and their irregular disposition. We were obliged to traverse this part on foot, the path being so rugged as to put riding out of the question; leaving this we cross over the hill-range dividing the Wahidee and Owlakee tribes, and descend by a precipitous nullah into the valley of Khubr. While slowly making our way here, we were fired on and stopped by a party of plundering Bedouins; but the presence of Shereef Ali, who appeared to have great influence with them, restrained them, and we passed without further opposition. We continue to follow the wady over a plain dotted with low hills, down to the village of Khubr (خبر), where we arrived at 6 P.M. We were at the threshold of the village when the clouds, which had been gathering behind us for some time, came down in a torrent of rain, and we were glad to take shelter in the house of one of the Shereef's friends. The heat and smell, however, were so insufferable, that we left it the instant the rain abated, and took up our quarters outside in the courtyard. Khubr is a town of the Gūmūsh, subtribe of the Owlakee, situate in a small gravelly plain or valley, cut up by numerous nullahs, and containing perhaps 25 square miles. There are several date groves and a good deal of cultivation about, the alluvial soil yielding excellent crops. Honey is said to be very abundant in the hills around. We here sent back our Habban escort of four men, taking on five of the Gūmūsh instead.

Friday, 22*nd*.—Left Khubr at 6.30 A.M., direction south-west,

along the nullah, and through the cultivation for a short distance, then over low hill-ranges—a most barren, desolate country all the way. Just as we started, the son of Sultan Fereed of Yeshbūm arrived; I had already gone on some distance when he came up and we sat down by the side of the road. He said his father having heard the report of our arrival at Habban, had sent him to bring us to Yeshbūm; that he had arrived at Habban just after our departure, and had followed us on; he wished us much to turn back and go with him, but this was impossible, so we made the best excuses we could, promising to send his father a present by the Shereef. Half-way on the road we came upon a small plateau, the soil of which looked as if it would repay cultivation. After passing this we descended into a nullah, along the bed of which we continued until we halted for breakfast. Here again the appearance of the hills was very curious and striking, the strata having been in a molten state, and now lying confused and mingled together. At noon we resumed our journey along the winding course of the nullah, until we arrived at Mahfuz (محفز), a town of the Shimia where we were received very civilly by the chief. Here we pitched our tent, it being more private and comfortable than the accommodation they offered us. Mahfuz is a small place of fifty or sixty houses, with the chief or "Akil's" house built as usual on a small eminence close by. It is situated in an extensive plain of perhaps 100 square miles in extent called Mongaah (منقعه); the soil is light and sandy, and almost the whole of it is under cultivation, producing all the common grains except wheat. Shereef Ali here sent his own camels back to Habban, procuring us others from the Shimai; he wished us to give $20 to the five men we had brought from Khubr this morning, and another sum to a party of Bedouins who, it seems, had followed us here. These men had endeavoured to stop us on the road, and levy blackmail; and one pugnacious youth, with a hatchet in his girdle, had thrown a big stone at our heads to show his manliness. We had resisted the imposition at the time, and now again refused to give anything on principle. In the evening we had some rain, and during the night a sandstorm. Water here is abundant, but has an unpleasant flavour. Distance from Khubr 17 miles.

Sunday, 24th.—We were unsuccessful in getting the camels yesterday, but they were promised at noon to-day. However they did not turn up till 3 P.M. though we were packed and ready at the time. After a short journey in a westerly direction, we halted for the night at a watering-place called

Nejed. At 5 o'clock passed a small hamlet named Shegma, where there is a guard-house of Sultan Abu Bukr. Our route was among the hills down the pleasant Wady Howr, which is generally well wooded and fragrant, and at no place entirely devoid of thick underwood,—the dowm palm (*Hyphæne*) particularly abundant,

Monday, 25th.—Started at 4 A.M. and rode till 9.30 A.M., when we found excellent water at El Kuliya and halted. The wady grows gradually larger, and is now nearly 300 yards wide. At 5 A.M. came to springs of brackish water, named Bir-el-Tajarach, bubbling up in several places. Our escort is the best we have had since the Deaybees—they are a merry open-minded set and have a great reputation for intelligence. At 3.45 P.M. we left Kuliya and continued our course down the wady, still thickly clothed with verdure; tamarisks, acacias, palms, and nabak-trees are the most common. After 4 miles, two large nullahs join the wady, one on each side, named Nufnufah and Kalasai. There was no scarcity of water; we passed several springs, and a small stream ran trickling all the way. At 6 P.M. camped at a spot called Soheb. Distance from Nejed 21 miles. The road in front is said to be infested with Bedouins, of whom our escort are much in dread; unreasonably so, it appeared to me, for they are more troublesome than dangerous. Those we passed to-day resented our intrusion with much indignation, and took up stones to throw at us. They were miserable, famished-looking beings, and were easily satisfied with a little coffee and grain. They manage with great difficulty to eke out a bare subsistence from their flocks and toddy-trees. They are all Ba Kāzim. From Soheb at 8.30 P.M., a most tedious, fatiguing march of 7½ hrs.; the night was quite dark, and we could see nothing of the country. Our road, after leaving the wady Howr, led over a broken and hilly country intersected by nullahs. At 10 P.M. passed Ain, a watering-place, and later on came to an encampment of Ba Kazim; here the Shereefs were entertained by them, and two followed us on to our camp, where we gave them some cloth, &c. The water at this place, which is called El Akhdar, was most fetid and disgusting. Troops of baboons were here howling and barking all round us. To-day we wrote to Sultan Abu Bukr, at Howr, excusing ourselves from paying him a visit as we were in a hurry to push on. We also took the opportunity to obtain supplies of flour, coffee, and dates from the town.

Tuesday, 26th.—Started at 2.45 P.M., following the course of the wady which, as well as the spring, is named El Akhdar. At 3 P.M., passed on our left a huge irregular mass of sandstone, whereon we found numerous Himyaritic inscriptions, or rather

scribblings, rudely executed; some of the letters were very large and of peculiar form, others were apparently recent. The wady making its way among the last low range of hills, emerges at length on to a broad, extensive, sandy plain, stretching away to the sea, which lies visible in the far distance. The wady Howr now lies to the west, having been left yesterday; this, in the rains, which were just beginning, must be a very swift and impetuous torrent from its depth and rapid fall. It is a pity some of this vast body of water is not preserved, the alluvial soil of the plain would be most fertile were it irrigated properly. The strip of plain we now traverse, lying between the sea and the hills, which have been gradually decreasing in size since leaving Habban, averages probably 8 to 10 miles in breadth, with a gentle declivity towards the sea. Proceeding south towards a long black hill, behind which lies Howr, we make our way a little west and camp among sand hills at 7.30 P.M. Distance 14 miles.

Wednesday, 27th.—From 5 to 11.30 A.M. General direction south-west, over an undulating sandy country, with temām grass and mimosas. Soon after starting we were overtaken by Sultan Abu Bukr's son and grandson. They said the Sultan had sent them overnight, on the receipt of our letter, to the place where the messenger said we should sleep; they had fired 30 shots, while seeking us, to attract our attention, but failing to do so, had followed us on in the morning. They were afraid of Abu Bukr's anger should they have to return without us, and pressed us to go with them; we were equally anxious, however, to press forward, and therefore excused ourselves and continued on our way. Found excellent water at Ba Subbahi, where we halted under the shade of a large spreading mimosa. About an hour after our arrival we were surprised by the appearance of Sultan Abu Bukr himself, who rode up to our tree and remained with us in conversation about two hours. We were sorry, of course, he had had the trouble of coming so far, and made our apologies for not having paid him a visit. He said he did not wish his people to imagine there was any disagreement between us, and he had besides several requests to make; one of which was assistance in making a bunder at Mugatein, where there is fair shelter for small buglas. He still wished us to turn back and be his guests for a day or two. Sultan Abu Bukr is a rather unfavoured-looking man of about 50 years of age, with his well-known stern and resolute character strongly marked in his large features. He is much feared and respected by his tribe. He said he had been ill with fever, and he certainly looked very weak and emaciated. He told us of some ancient ruins and a very deep well dug through the solid rock at

Mathuf, a place close to where he had slept. Our Arabs had assured us that nothing of the kind existed near. At 4 P.M., again mounted and resumed our journey. A short stage of $2\frac{3}{4}$ hrs. along the sea shore, till we camp among the sand hills. No water.

Thursday, 28th.—To Bir Merwan, $5\frac{1}{4}$ hrs.; water good. Our march was uninteresting, but the camp a pleasant spot; trees were numerous, asclepias, arak and acacias. The weather now was cool and delightful, a strong fresh sea breeze by day and night. In the afternoon, on again for $5\frac{1}{2}$ hrs. At 5 P.M. pass the hamlets of Khubr and Koheir, where there is a little cultivation. Here is the boundary between the Owlakee and Fudthlee territories, we now met a party of Merākash with the chief's son, who came up and insisted on our hiring camels from them while in their country; we declined, and brought the young man on with us. The well at Khubr is within 20 yards of the sea, yet the water is perfectly sweet. At night it rained and was very chilly.

Friday, 29th.—From 3.45 to 8.45 A.M. along the sea-shore. Passed the wady Semrif half-way. We had previously sent a letter to Sultan Haidera, informing him of our approach; and soon after arriving at our halting-place, opposite Sureea, his chief residence, we received intimation that he was waiting to receive us. We accordingly proceeded there, and after an hour's ride met with a most friendly reception from Sultan Haidera and his brother Hussein, who entertained us in a mat shed they had prepared; they also entertained all our people. At 3 P.M. we returned to our camp, Haidera giving some sheep, for which we sent a return present. Haidera told us of some ruins at Serrar, which he described as a tower on the top of a conical hill, approached by a spiral road. At 6 P.M. we continued our journey, and after a short march halted for the night in the sand hills at 9 P.M.

Saturday, 30th.—Started at 6 A.M., and at 10 A.M. arrived at Shugra, a growing town and bunder. Distance from Sureea 24 miles. This place was occupied by the Expedition in 1866, and the Sultan's house destroyed, the latter is now being rebuilt on a larger scale than before. We were now in the beautiful and fertile district of Abien, and having nothing to detain us we pushed on and arrived the next morning in Aden.

The country between Bir Ali and Aden, through which we passed, is occupied by four large tribes, the Wahidee, Deaybee, Owlakee, and Fudthlee. These, with most other tribes in South Arabia, became independent about a hundred years ago, when the dominion of the Imams of Sanaa (which had risen again since the expulsion of the Turks in 1630) came

to an end over Yemen, and was confined to the walls of their own city.

The old and simple patriarchal form of government was re-established by them; the leading man of a number of families becoming the chief or "Sultan" as he is termed, and retaining the succession hereditary in his family. This Sultan has no despotic power, and is unable to take the life of any member of the tribe; he is indeed answerable to them for all his acts and proceedings; and his decisions, whether civil or criminal, to be respected, must be in accordance with the law of their religion and the customs of the tribe. In cases of emergency, he consults the Sheikhs of the subtribes, whose advice he is bound to take and act in accordance with; and in cases where the members of the tribe are not satisfied with their decisions, and in matters of dispute with other tribes, a council of Shereefs or Sayyuds is called for the final adjustment of the difficulty.

These Shereefs are a great power in the State, and exert almost unbounded influence over the tribes in Hadramaut and East Yemen. Even among the wild Bedouins of the hills they are held in respect and awe, from their descent and consequent sanctity and their superior learning. Few important matters indeed are discussed or entered upon without consulting them and obtaining their approval; and their advice is sought by all. In ceremonies, too, they often take precedence even of the Sultan. Many of them make it their especial business to act as peacemakers between contending tribes; these men are well known all over the country, and their mere presence is often sufficient to put off an impending conflict. The want of authority and power among these Sultans, despite their magniloquent appellation, may be accounted for by the absence of wealth or any large source of income on their part, the only means they have being the ashoor, a sort of property tax, and transit dues, besides the profits arising from any landed property of their own. Most of this income, from whatever source derived, has to be paid away to the Bedouins as a retainer for their services when required, and to restrain them from lawless acts. There are no men of any real wealth in the country; indeed, the universal equality of fortune is rather a remarkable feature in this land. The form of government and relations of the different parts of the tribes, curious as they seem, are quite in accordance with the genius of the people, as is proved by their existence from the earliest times, and admit, perhaps, of a greater degree of personal freedom than that of any other country. The population may be divided broadly into two classes, the settled agricultural people and the Bedouins. The

former hold the land upon a military tenure, engaging to serve in time of war when called on, and also pay a certain portion of their crops to the Sultan. The Bedouins subsist upon their camels, goats, &c., and what they can obtain from the Sultan and from travellers, upon whom they levy a syāra, or road tax. There are no nomads.

The first to be noticed of the four tribes I have mentioned is the Deaybee, the smallest, perhaps, but by no means the least interesting. The strip of country they occupy lies between the Wahidees and Owlakees, and extends from the sea coast to about 50 miles inland, and includes a portion of the wady Maifah, which they have obtained by purchase. They have no Sultan or Sheikh over them collectively, but each of their seven divisions, of which the largest is the Aul Abdullah, is under an Abu, or "Father." They are undoubtedly descendants of the Himyarites, and are not a little proud of the name. They use it to this day as their war-cry, and the neighbouring tribes call them Deaybees or Himyars, indifferently. They still retain, too, their ancient language—one of the several dialects of the Sabæan. It appears to be different from the Mahra. They do not speak Arabic with any purity, though most of them are acquainted with it, but mingle a great number of their own words, so much so as to be at times almost unintelligible. The Deaybees are, in short, a very interesting people and well worthy of careful study; a short sojourn among them would, I am sure, amply repay in its results any one who would undertake it. The other tribes around, who also trace their descent from the Himyars, are the Yāfai, Naamān, Gūmūsh and Merkashi. The family descent of the first, however, I am doubtful about, and of the second I have no information. The Deaybees have a bad reputation everywhere for their marauding and rapacious propensities; but of the truth or otherwise of this we had no opportunity of judging. To speak as I found them, I entertained a favourable opinion of their character.

The Wahidee tribe, one of the largest on this coast, takes its name from the founder, Abdul Wahid, a celebrated Koreish chieftain, who conquered a large portion of territory from the surrounding tribes. His principal residence was at Habban, a town formerly of considerable importance. This tribe has lately become divided, and is at present ruled over by three different Sultans, viz., Sultan Ahmed of Habban, Sultan Hadi Abdulla of Bir Ali, and Sultan Salib Nasir of Eisan, but their power, as I have observed, is merely nominal, and they are scarcely richer or better off than many of their subjects. This tribe, whatever it may have been once, is not now held in much respect or fear by its neighbours for its warlike spirit

and bravery. It is, indeed, probably one of the least aggressive tribes in the country. They possess in the wady Maifah one of the most fertile and productive districts of East Yemen, and have consequently settled down for the most part into peaceful tillers of the soil, fighting only when necessary to repel marauding intruders,

There are several large and thriving towns in this district, of which the two largest and most important are Hota and Habban. The former consists of an assemblage of lofty, detached, castle-like houses, and presents on the first approach a very striking and singular appearance. It is situated in a gorge of the hills, on the banks of the wady Amageen, girt round on every side by high and almost inaccessible cliffs. Hemmed in by these, and unapproachable except by the wady, the form and size of the houses would enable the inhabitants to resist successfully an attacking Arab force. The houses are from six to eight stories high, with very small windows, none of which are within 10 feet of the ground, and the rooms are so low that one is barely able to stand upright in them. The average height of the houses appears to be about 60 feet. The material of which they are built is a tenacious clay, mixed with lime, and the bricks made of this are so strong, though merely sun-dried, that several days' continued rain, it is said, does not affect them in the least. In the town proper there may be 200 houses, and along the sides of the wady, towards Kail, perhaps three times as many more; altogether I should estimate the population at from 8000 to 9000 souls.

The government is administered by a Sheikh named Ahmed-al-Haidee, under the Sultan of Habban, for whom he is supposed to collect the taxes, receiving a certain share for himself. He appears to have considerable influence over the people. There is a Cazee, but he is subordinate to the one at Habban, and is a man of no learning. There are but two mosques in the town, a surprising and significant circumstance when we consider the size of the population. The Khutba is read for the Sultan of Habban. The inhabitants are all Mushaikhs, or descendants of some great saint, and consider themselves superior to and almost independent of the rest of the tribe. They are a taller, fairer, and more slender race than the other Arabs we had met, and wear their long curling hair loose or fastened behind by a band. They appeared an ignorant and superstitious people, and consequently very bigoted and fanatical, yet they are by no means strict Muslims, and are very lax in their religious duties, neglecting their daily prayers, except on Fridays, when the Sheikh, followed by a large crowd, proceeds in state to the mosque. The conversa-

tion of the men was almost entirely free from the pious ejaculations so common in the mouths of Muslims in all countries. The women are very fair, but with a slight yellowish tint; of their looks I will say nothing, the general absence of female loveliness in Yemen being proverbial. They are dressed in the usual hideous long blue blouse, or loose gown of the country, and their hair is worn in long ringlets round the head, which is rather becoming. They go about unveiled, and appear to have more freedom than is generally accorded to the sex in Muslim towns.

The grains sown here are wheat, jowaree, bajree, barley, and tahef, and four crops are reaped yearly, viz. one rain and three irrigation crops. The fields are very neat and regular, and the state of the cultivation generally very superior. The rotation of crops is observed. The wady is bounded for irrigation by numerous stone walls, for which the wells afford an abundant supply of good water, which is drawn up by bullocks, the mote system of India being employed. I did not notice any difference between the agricultural implements here and those in use near Aden. There are no fruits cultivated besides dates and lemons. The few cattle owned by the inhabitants are sent to the neighbouring deserts to graze, under charge of the Bedouins. Sheep and goats are numerous, but there are no horses; they were introduced once, but the want of pasture rendered it difficult to keep them, and they soon disappeared. The only manufactures are a thick felt for camel saddles, in which both men and women are employed; and a coarse cloth for lungees. The woof of this is spun by the women. Dyeing is carried on extensively, the indigo being imported from the Bir Ali and Aden; for besides their own manufactures, they prefer to import cloth from Aden unbleached, and dye it themselves, considering it cheaper. Blue is the universal colour worn here by both sexes, and we found no other dye used. There are a few carpenters and blacksmiths in the town; the goldsmiths are Jews from the colony at Habban, who travel about the country working where required.

Hota has no market, but once a year, on the 12th Rajab, a great fair is held at the shrine of a certain saint near, at which the Bedouins assemble in numbers, and exchange their products for the various commodities they are in want of, such as cloth, dates, &c.; at other times there is little traffic going on; indeed, as will be perceived, the internal commerce of this country must be small, from the simple habits and few personal wants of the people, which render them almost independent of external sources of supply. Their ordinary food consists simply of coarse jowaree, or bajree bread, with ghee and dates, which

are much eaten. Very little rice is consumed, and the Arabs are not vegetarians by any means. The only beverage is kishr, which here is an infusion of coffee, both beans and husk. In Sanaa, West Yemen, and Aden, the husk alone is used; in Hadramaut, they infuse the bean only. A Hadrami never dreams of setting forth on a journey without taking his coffee with him. Kishr is not a very tempting drink, especially with the ground ginger and cardamoms with which it is always prepared. It is in taste like very weak coffee, or perhaps like the mixture of tea and coffee drunk formerly under the name of "twist" in England. The husk, however, in these parts is more esteemed than the bean, as being less heating; and in the Aden bazaar it is more expensive, costing a shilling a pound.

There is but one Fakih, or learned man, in Hota; and there are no schools, but a few boys receive a little instruction during the month of Ramzan.

Literature and Art are at a very low ebb; indeed, they can scarcely be said to exist. Most of the Shereefs know how to write, and generally, also, the higher Sheikhs; but we neither met with nor heard of any real scholars, such as West Yemen is able to boast of. The climate here during our stay was delightful, the air being light and exhilarating. At night it became quite cold, and we generally had a cool breeze throughout the day. It appears, however, to be a feverish and unhealthy place. We noticed very few old men in this district. The town of Habban is irregularly built on very uneven ground, in the midst of a plain of some 60 square miles in extent, interspersed with low hills of various heights, and intersected by nullahs. This plain is bounded by a table range of hills to the north, and irregular serrated ranges to the south and east. Its elevation is about 3000 feet. Habban is not a large town, and contains only about 250 houses, and between 2000 and 3000 inhabitants. There are, however, numerous Bedouin houses outside in every direction.

The Jews number about 400, and dwell in a separate quarter; they have been here beyond tradition, and this is one of their principal colonies. Though very industrious they are wretchedly poor, and are not allowed to own any part of the soil; they are chiefly artisans, journeymen gold and silver smiths, &c.; the women rear great quantities of poultry. On two eminences near the town are two watch towers, each containing five guards, who keep a look-out over the surrounding country and give notice of an approaching enemy. The houses are of much the same structure as at Hota, and of the same mud-coloured appearance. There is a small market. The fields around produce wheat, barley, tahef, jowaree, kinnib (or dagoosa), and bajree,

but no dates, coffee, or cotton. Indigo grows wild, and "send," a species of aloe, of the fibre of which the common white rope of the country is made, grows abundantly. Cattle, sheep, and goats are scarce and dear. The supply of water is very limited, and procured only with difficulty from deep wells. This scarcity is the cause of the very limited extent of cultivation round the town, precluding artificial irrigation and leaving the fields dependent on the rainfall for their supply; were it otherwise the rich alluvial soil around would yield a grateful return to the agricultural labours of the inhabitants. The prices of food during our stay were, for one dollar, 3½ kelas wheat, 4 kelas jowaree or bajree, 10 rutl ghee, 16 rutl coffee, 10 fowls. The rutl here is 13 dols. weight, that of Aden being 16. The kela is 12 lbs. Salt is obtained from Nisāb and Hazna, where there are mines of it. The kafilas to Nisāb and Mareb, pursuing the same route as of old when the Arabs were the medium of eastern and western commercial intercourse, take on tobacco, cotton, and cloth, and bring in return coffee, salt, &c. The present Cazee of the town is a young man; but his father, the late Cazee, was a man of noted sanctity and learning, and of great consideration in the country. There are six mosques, the only whitewashed buildings in the town; the Khutba is read for Sultan Ahmed. There are about half-a-dozen reputed fakihs here, but no schools. The Sultan is very poor, and his house is almost entirely unfurnished; he possesses but one slave. The little revenue he receives from his subjects is mostly spent in subsidising the Bedouins, whom he is obliged to conciliate. The "ashoor" for each camel is a quarter of a dollar, for cattle per head $\frac{1}{8}$th, and for donkeys $\frac{1}{16}$th per annum. He has a small quantity of land of his own under cultivation. There are six towns in the territory subject to him, viz. Randa, Shaab, Girdan, Amageen, and the two I have already noticed. The first of these, Randa, is about half the size of Habban, and is inhabited by Haïook weavers, who are considered an inferior caste to the other Arabs; they are quite distinct, however, from the Akhdām. About six or seven Mushaikh families also reside in the town. The other three towns are probably of about the same size as Randa. It is difficult to note approximately the population of the Habban district; it is, however, very thinly peopled, the hilly nature of the country allowing but a limited area of cultivable ground.

The ruins of Nakab-el-Hājar, though in the midst of the Wahidee territory, do not belong to this tribe, but are held by the Bedouins, of whom there are five clans occupying the extent of country between Nakab and Radēha, viz. the Ba Fakhēr, Hul Saad, Ba Bahar, Ba Daen, and Hul Ba Rasheed. These

Bedouins are perfectly independent of, and unconnected with, the tribes surrounding them, and are a wild and lawless people, bearing a bad reputation among their neighbours.

The next tribe we come to, the Owlakee, is also a very large one, and is divided into two parts, perfectly independent of each other, and each ruled over by its own Sultan. Like the Wahidee, it was formerly united under one, but was divided between the two sons of a powerful Sultan many years ago. The upper, and perhaps the more numerous and important branch, called the Owlakee-el-Nisab or Owlakee-el-Alisu, occupies the interior, and is at present under the rule of Sultan Awad Abdulla, whose residence is at Nisab, a large town situate in an immense plain. This tribe or branch is composed of two distinct families of the great Yafai tribe, the Beni Máam and Mahajir; the former, an offshoot of the large tribe of that name, is more immediately under Sheikh Fereed bin Bowees of Yeshbum, and is composed of 18 clans; this is the superior and more important family. The Mahajir occupy Nisab and the surrounding country under Sultan Awad; in it there are 23 clans, and it is a numerous family, having, it is said, about 100 villages. The Owlakee is a warlike, but not a predatory tribe. I am unable to hazard a guess at the number of the population. Many of them are in the service of the Nizam of Hydrabad, and enjoy considerable influence and wealth. The lower tribe, called the Owlakee Ali Nasir, or the Owlakee Ba Kazim, are subject to Sultan Abu Bukr Abdulla at Howr, and hold the extent of coast between the Fudthlees and Deaybees. This branch may number about 15,000 souls, and is divided into, or rather consists of, two distinct parts, the Gūmūsh and Ba Kazim. The latter has many subtribes, of which the principal are—the Shimai, Jarelee, Hŭtlee, Munsooree, Hākee, Mārebee, and Hul Ba Jerādee. Of all these the first one, Shimai, takes the lead, on account of the supposed superior intelligence and sagacity of its members. They are always the first consulted in matters of importance, and their opinion is held in much respect by the others; their protection, too, is necessary to strangers passing through the Ba Kazim territory. The Shimai villages are at Hota-el-Mahfuth and el-Kubs. The next in importance is the Jarelee, who being the most numerous, form the army, and are the chief strength of the tribe. The Gūmūsh are a peculiar race, and though among the Owālik not of them. They assert themselves to be descendants of the ancient Himyarites, and inhabit the valleys bordering on the Deaybees, with whom they claim kinship. Their head-quarters are at Khubr. They are a brave people and feared by their neighbours, to whom they seem superior. A large extent of the Owlakee country is under cultivation, and

they have numerous flocks of sheep and goats, and herds of camels in their extensive pastures; they possess also a fine breed of horses, the only tribe in these parts that has any. The extent of coast line held by them is about 60 miles. The Sultan, Abu Bukr, succeeded his cousin, Manassir, some seven or eight years ago, when the latter, with his son Abdulla, was treacherously murdered by one Ali Abdulla. At the time of our visit Abu Bukr was in difficulties with his subjects, in consequence of four men having been killed in anger, and unjustly, by his brother; the occurrence had taken place a short time previous and the tribe were highly indignant, saying it was a departure from the customs of their fathers, and the same thing might occur again to their dishonour, unless they asserted their rights at once. The Sultan was about to propose some reparation to the relatives, but if not acceeded to, a meeting of Sayyuds, or a conference of the whole tribe would have to be convened for the discussion and final adjustment of the affair. The custom of subjecting accused persons to trial by ordeal, Bashaa, as a test of guilt, is still in use among this and neighbouring tribes, but it is not much resorted to, unless for serious crimes. There are numerous methods, but the more usual one is the application of a heated knife to the tongue.

The Fudthlees are a restless, warlike, and ambitious race, holding the seacoast and the range of hills from Mugatein to Iwaad, a distance of nearly 100 miles, having extended their former limits considerably by dispossessing the Yafais of Abien some thirty years ago. For many years after the occupation of Aden they caused an immense deal of annoyance under a troublesome old chief, Sultan Ahmed, by plundering kafilas on the road, and so preventing supplies being brought into Aden, but since their late chastisement they have settled down into peaceful and orderly neighbours; under Sultan Haidera, who has succeeded his father, they are rapidly increasing in wealth and prosperity, and are now among our best friends.

The Fudthlee tribe is very numerously subdivided, and may be considered in three sections, the Merkashi, the Ellah Bedouins, and the clans occupying Abien and the low ground; these are the Nakhai, Massadee, Saeedee, Ahl Saeed, Ahl Shedad, and Ahl Haidera Munsoor. Some of them, however, are merely nominal, and contain only a few families. They may number 5000 people. The Ellah Bedouins comprise nine clans, viz. the Ellahi, Hascei, Jaadree, Maisree, Arooli, Fatahānee, Hātūnee, Hanashi, and Ahl Sheneen. They are by far the most numerous section, amounting perhaps to 9000, and inhabit the hilly portion of the territory and Dethina, which is a dependency of the Fudthlees, but paying tribute to the Sultan

of Nisab. The Merakāsh, like the Gūmūsh and Deaybees, are of Himyar descent, and are identical with them in customs and character. They hold the eastern part adjoining the Owālik. The loose morality of their women is notorious, though considerable laxity exists among all the tribes in these parts, the sale of wives even being a practice not entirely unknown to them. The Merākash number about 3000 individuals, making the total strength of the tribe about 16,000 or 17,000 souls. Many of the clans of these tribes, it will be observed, derive their names from women. This is a common practice, and it is not unusual for men, too, to take the mother's name instead of the father's, as a surname; for instance, Abdulla bin Fatima. The country produces no coffee, but the hills abound with myrrh-trees, the gum of which is gathered by Somalies; and in the low alluvial plain of Abien the Fudthlees possess one of the most fertile districts in South Yemen, which would be very productive if properly irrigated. The soil is a sandy loam. It is watered by two wadies, the Hassan and the Bunna, both branches of one source, rising in the hills to the north-west, inhabited by the Deira, a clan of the Houshebi tribe. They were both flowing when we passed, the Bunna being about 400 yards broad and running over knee deep. The sea is bordered by a thick forest of mimosas, and beyond, towards the hills, are broad fields of grass and corn, stretching away to the Yafai valley. The uncultivated parts are either sandy patches or are covered with brushwood and thick jungle. The jowaree grows to a great height, considerably overtopping the head of a man on a camel. The name Abien is commonly applied to the whole extent of country held by the Fudthlees, but they themselves, and it appears correctly, understand by it only the strip of plain lying between the Yafai hills and the sea, and containing perhaps 200 square miles. It produces jowaree, bajree, grass, wheat, barley, sesamum, cotton, and wurrus, &c. The land is all owned by the Sultan, and there are no freehold proprietors. The tenant, generally, has to pay half the proceeds of the crops to the Sultan. In the neighbouring country of Lahej the land is in private hands, but is being gradually bought up by the Sultan. Ambergris is sometimes found on this coast; it is highly prized, and is a monopoly of the Sultan. I believe there are no manufactures carried on among this tribe. The chief towns are Sureea, Shugra the bunder, el-Sálih (so called from the soda plant which grows there in great abundance), el-Khor, Jowala, Khamila, Peran, and Amodea. Sureea is a small town securely situated in a ravine of Jebel Arees (عرحض), which rises about 3000 feet behind; its elevation is 700 feet above the sea, from which it

lies distant 5 miles. The ground between is stony, and furrowed by nullahs. Near the town is Dar-el-Harz, a quaint old gray tower, the chief stronghold of the Fudthlee Sultans.

I regret having no better information to offer than the above cursory remarks on the interesting subject of the condition and tribal divisions of this people, but the disadvantages we laboured under in the difficulty of interrogating the inhabitants, and in being unable to take notes freely, for we could write only in secret, will, I trust, be taken as some excuse for any deficiencies.

Attempting no kind of disguise, but travelling as Europeans, and being the first, moreover, that had visited that region, we were naturally regarded with no little distrust and suspicion, and were everywhere narrowly watched. The able geographical sketch of the country, contributed by my companion, the only result of any value of our trip, will however add somewhat to our knowledge, and dispel a little of the cloud that hangs over the land. I trust, with him, that some one may be induced to explore the country thoroughly and bring to light its long concealed mysteries, for it seems indeed inexplicable, in this age of discovery, that a country so remarkable, so interesting from its historical associations and antiquarian wealth, should attract so little notice.

ADEN, 20*th February*, 1871.

MUNZINGER'S REPORT.

I WOULD not have ventured on a geographical outline of the triangle between 'Ain, Habban, and Howr, if Arabia were as well known as it is interesting. But so little real information is to be found in travellers that any new addition cannot but be welcome.

I am well aware that all I am going to say will only prove our shortcomings; but I hope that the knowledge of all we could *not* look after will induce other and better men to visit it. We were allowed to travel through the country and to see as much of it as would a traveller by railway; we could obtain, therefore, only a general impression, and that I am going to give a brief account of.

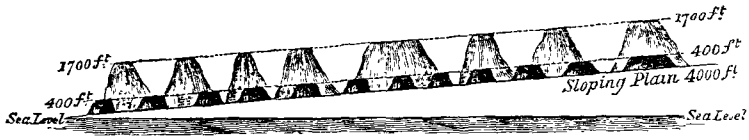
In the triangle lying in our track, and the country round it, two distinct geological and also geographical regions presented themselves to us, which I call, from their principal rock-formations, the Sand-and-Lime Region (I), and the Metamorphic Region (II). When we have explained this denomination

everything in the country, vegetation, animal and human life, will be found to be determined by it.

The sand-and-lime region has its west frontier near Habban, and runs in a south-east direction; the metamorphic region leans against it from the west and extends south-east and south-west, its waters flowing principally northwards. I am not certain about the Deeaybee or Himyari hills; they look from the north side like sand and limestone; but fragments in the water-courses, and the knowledge that they are woody, make me believe that their principal character is metamorphic, guided only by the high hill-range over Maifah.

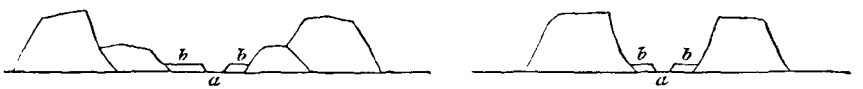
The geographical and geological appearance of the two regions is very distinct.

The sand-and-lime region presents a rising plain, nearly filled up with a double range of hills, one consisting of inaccessible blocks (or Ambas), 1500 to 2000 feet high, and the other of hills 300 to 500 feet high, more broken and accessible. The plain itself has a slope of 1 : 80 (on the line from 'Ain to Habban). The whole region would present the aspect depicted in the following sketch, minor irregularities excepted.



These hills have nearly all the same elevation above their oblique base. They cover nearly 8-10ths of the space, without forming a great continual ridge or mountainous country. They have some distant analogy with the Western Jura.

But as these hills, by their rocky character and their inaccessibility, exclude any idea of vegetation or animal life, they influence the country only by being the source whence water, sand, and lime are washed down to the plain, and disturb its surface. There is then only left for consideration the rising plain, which is represented by large watercourses (or nullahs), with alluvial strips along their banks, narrowed by the lower, and sometimes even by the higher, hill-range.



a. Wadi (Nullahs). *b*. Alluvium.

The rock we observed in this region was sandstone, lime, clay, and conglomerate. We brought back some specimens.

The strata are nearly horizontal. The rock is in a state of rapid and ever active decomposition, which gives the hills very extraordinary tower-like forms: the water working on the barren friable sandstone carries away piece after piece; but it has much less power on the lower hills, which consist of hard conglomerate, and strong red and yellow clay.

The metamorphic region presents quite a different aspect and character. It consists of a disorderly agglomeration of hills, all connected together and forming a mountainous country (not plateau), seldom interrupted by disconnected plains and narrow "nullahs." The form of the hills is rounded or conical, with soft lines, allowing trees and grass to grow, and favouring animal life.

Its rock is gneiss, slate, and quartz; it shows often traces of the extraordinary pressure it has been subjected to, by its curved strata.

The stratification is rarely horizontal, but generally in great angles, and lying pell-mell.

A curious feature of this region is, that now and then isolated sand and lime hills, easily recognised at a distance, stand out of the metamorphic hill-land like islands in the sea.

The metamorphic region would present the following aspect:



Metamorphic Hills.

Let us now examine the relation of the water-courses to the surface, as far as we have observed it.

The map shows that from the metamorphic, or Owlakee stock, all the "nullahs" (wadi), of this country rise; from it also comes all the alluvial soil fertilising the sand-and-lime region. We find as principal:—

1. Wadi Maifah, direction south-east.
2. Wadi Howr, „ south-west.
3. Wadi Nisab, „ north-east.

As far as we know, all three rise from the same stock.

We hear that the principal waters of Dethina go in a south-west direction to Abien (Fudthlee land), and it is very probable that the district of Dethina is only a dependence or lower range of the Owlakee stock.

All these nullahs have in an inverse sense (north exchanged against south) some analogy with their most noble brethren of

Central Europe, the Alps corresponding to the Owlakee-Alps, the Wahidee lime-and-sand-hills to the Jura, the Yuman lowland to the Gulf of Aden, and the north sand sea to the Mediterranean. We would compare the west Maifah to the Aar, Howr to the Inn, the Nisab to the Rhone.

I have not much to say about the character of these water-courses or nullahs (to adopt the Indian word). In the sand-and-lime region they are large and smooth, carrying sand and alluvial soil with a slow fall, and digging out their bed through the sand hills. In the metamorphic region, ravines or crevices were evidently formed by metamorphosis, filled up and levelled by the water carrying sand and boulders; the water availing itself of the clefts produced by plutonic action. The nullahs are, in consequence, rather narrow, have many windings, and erode but little their solid slaty banks.

Water in both regions lies generally 50 to 100 feet under the sand-bed; but it is found in large quantities. Running water is only found where overlying rocks or cataracts force it up to the surface.

Water in the sand-and-lime region is generally bad, and has a magnesia taste. In the metamorphic region it is rather brackish, quite analogous to the waters in the Shoho and Habab torrents.

An extraordinary exception to the general rule are what may be termed the artesian sources of 'Ain and Johaïl, &c., where, in the midst of a sandy plain lying near limestone hills, lesser hills rise, having copious springs of water.

As these hillocks are too small to explain the presence of strong springs, we can only suppose that it comes from the neighbouring hills by means of natural pipes.

I will now make some observations concerning the country beyond our track, profiting by native information, and deducing conclusions from what we ourselves saw. But I give the results with much reluctance, because experience shows that natives may give distances and names, but have no geographical instinct. A proof of this is Colonel Chesney's map of Arabia.

We heard, then, that north of the Owlakee-stock large fertile plains extend, the waters running north-east, and Nisab being the centre.

We heard, further, and Wrede's account corroborates the statement, that north of Wade-Doan lies the famous Bahr-el-Sāfi, or sand sea, *i. e.* a very low basin filled up with loose sand.

By induction from our own experience, these statements merit full belief, and we would try to explain them in the following way:—

We may suppose, north of all this country, that a basin once existed, extending from the longitude of Nisab far to the east, having a great depth. This basin has been filled up on the west side by alluvium from the metamorphic rock creating the Nisab plains, whilst north and north-east of Habban and Wady-Doan, which belong all to the same sand-and-lime region, the decay of the rocks on the north declivity filled the east side of the basin with sand only. I suppose the Nisāb alluvial plains and the sea of sand to be connected, the latter receiving the water of the former, and a continual fight going on between the vivifying influence of alluvial land from the Owlakee stock and the overbearing inlet of dead loose sand from the Wahidee Ambas.

If I have ventured on such hypotheses, I have done so only to excite further researches. A journey from Aden to Mareb, and thence to Makallah, would settle all the South Arabian watersheds.

From what I have said already, it is evident that the general appearance of the whole country is exceedingly dry. If we take the best time of the year, *i. e.* when all the country is under cultivation, in September or October—which would be only fair—a map ought to be coloured in the following manner to give a true idea of what the country is:—

1. The "Wadys," or "Nullahs," all in yellow (the water being underground), with the exception of short blue threads at Radeha and down the Mongaah torrent.

2. The sand-and-lime hills grey or yellow, being absolutely destitute of vegetation in *any* season.

3. Over the "Nullahs" some green spots, indicating the alluvial oases which are under cultivation, such as part of Maifah, Houta, the river down it, Lehe, Habban, Rhabi, Mongah, &c.

4. The Owlakee hills in clear green, enjoying some vegetation.

I may mention, by the way, that it is a great mistake of our map-makers to colour African and Arabian "nullahs" in blue, as if they were rivers full of water. Running waters occur, but are never deep.

The general appearance of the country I am describing is in many ways very similar to that of different parts of Abyssinia, and I looked out, of course, anxiously for any possible analogies, but I found no real uniform identity.

The sand-and-lime hills of the Wahidee look much like the little Ambas, near Debra-Damo, and of Tigré generally; the same table-land with perpendicular walls, the same speedy decay; but in Abyssinia the table-lands are connected among themselves. They are accessible, and large enough to maintain water and vegetation, and to contribute to the real wealth of the country; the valleys, also, between them, are much larger

and more fertile. In short, the Arabian plateaux are miniatures of the Abyssinian in every respect.

The Owlakee hill-land has some likeness to parts of the Habab and Shoho country in rocks, trees, and appearance. The Howr torrent resembles closely the Lebka or Haddas.

The Arabian coast is certainly much superior to the African, or rather Abyssinian coast, by the simple reason that great part of the highland slopes down to it, and sends to it its waters, forming large alluvial plains, with important settlements, such as Howr, Abien, Lahej, &c. Its climate is rendered also much cooler by the open sea breezes.

The African coast receives also some large "nullahs"; but some of them do not extend far inland; others are lost in the salt plains; the rest have, owing to the light soil, banks too high to be available for irrigation. The advantage is, therefore, all on the side of the Arabian coast.

From the geographical condition of the country, as here described, it will be quite easy to deduce the necessary effects it must have on Nature and man.

I have already observed that in the sand-and-lime region the hills are incapable of supporting any life, animal or vegetable; only the "wadis" are fertile, and even there vegetation is only possible when there is a little room left between hill and torrent, to be covered by alluvium. On these rare spots is concentrated human industry. Where we see vegetation it is produced by cultivation. There is, of course, a general absence of cattle.

The settlements there occupy the narrow alluvial strips along the wadis, out of which man strives to get his livelihood by careful tillage and manuring, and by watering from torrent and well. Hence the large and thickly-peopled colonies of Maifah, Hota, Habban, &c. They are oases in a true desert.

The condition of the metamorphic region is quite different; its accessible, continuous, undulating clayish ground favours vegetation and animal life. We find, in consequence, more grass, many trees, and wild animals; but I must confess that even here vegetation bears no comparison to similar countries in Africa. Nature is exceedingly frugal, and needs human labour to bring forth her powers—a lucky circumstance, I think, preventing the Arabs from sinking into the indolence of the Abyssinians.

A further necessary consequence of this condition is, that the metamorphic region is not destitute of cattle (camels and goats, no cows, there being more trees than grass). Some fixed settlements are to be found in the few plains, but the greater part of the inhabitants live with and on their cattle. I suppose the population of this region to be less than that of the sand-and-

lime region, but it is more generally distributed. There is more life throughout; much wilderness and wildness in land and man, but no utter stagnation.

Political and economical life is necessarily determined by the same natural influences.

In one region we find large independent settlements occupied in husbandry only; smaller, but tribe-like ones of cattle-breeders, and less culture in the other. We find no nomads; the character of the country, void of large grassy or woody plains, forbids it. We find general poverty, but equality of fortune, and so of power. Scarcity of room forces man to utilize every inch of it, to ameliorate it, and to increase his income by industry. He is even obliged to save room by building very high houses. The friable rock being bad material, leads to the employment of bricks, for which there is abundant first-rate clay. The absence of wood and iron forbids the arts of carpenter or smith. We find no furniture; even in the Sultan's house people sleep on the ground.

The products of the country are the same as in Abyssinia at equal elevations, with the addition of dates, millet, barley, wheat, &c. The coffee plantations occur more to the east on the great chain running parallel to the Red Sea; but I see no reason why it could not be grown here too, if irrigation was used as with common grain.* Indigo is grown, but not to a great extent. In the metamorphic region we saw plenty of myrrh-trees. Frankincense, we heard, occurs in the Himyar hills, but it is scarcely known by the Arabs.

The great disproportion between cultivable soil and bare sandstone will never permit a great increase of population, and I suppose that in old times things were not much better; the only large ruins we found being those of Maifah. However, I believe that the Government of those days, as it had more authority, did more to keep the torrents within the dams.

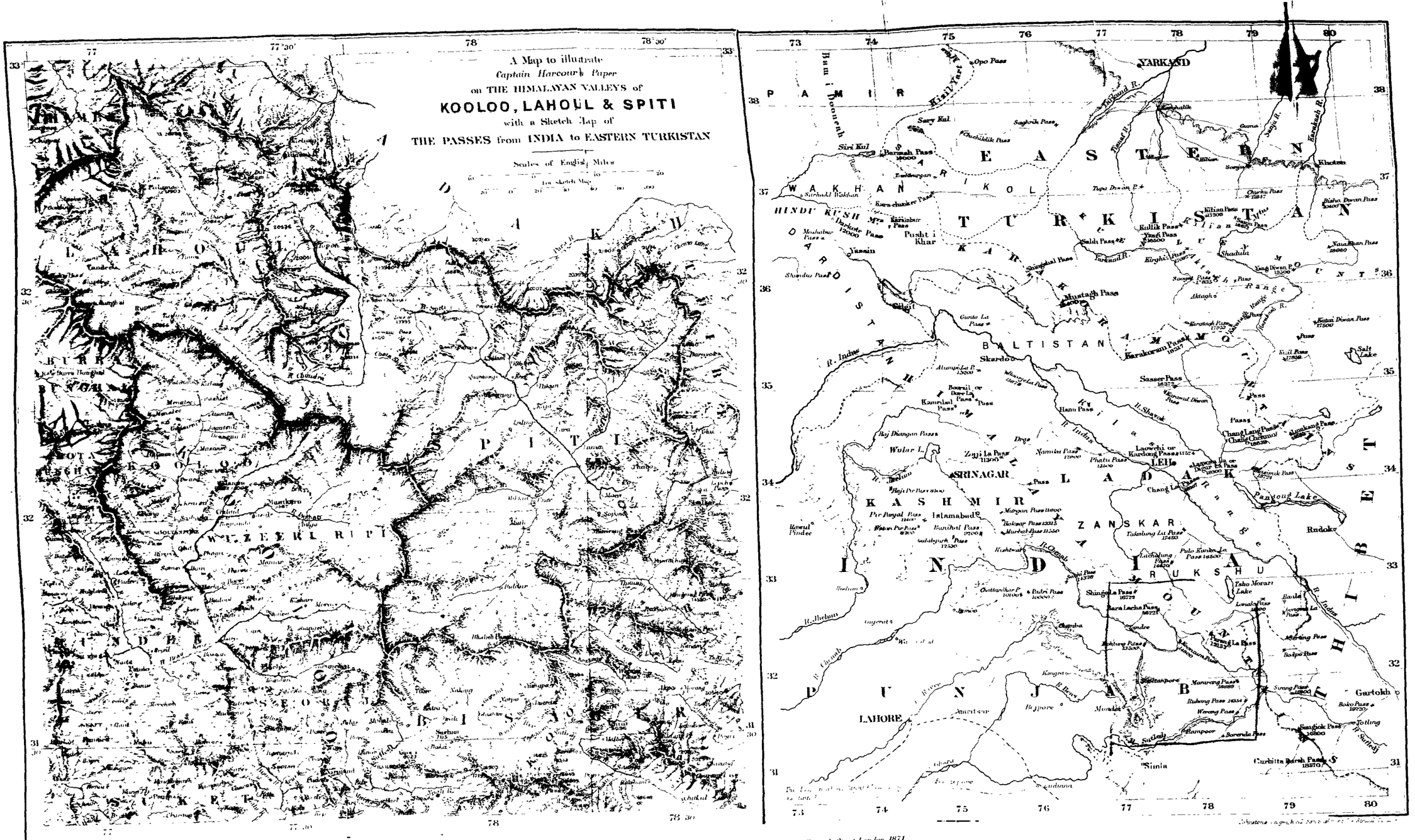
Trade is necessarily restrained to strict necessity; its routes, the torrents of Maifah and Howr, are indicated by nature.

I may conclude these notes by observing that the geographical and political boundaries coincide. The Wahidees hold the sand-and-lime region; the Owlakee the metamorphic hill-land and its northern slope. The old Himyarites (the Deaybee, Gumush, &c.) live where the two regions join and, meeting together, form a large hill-barrier against the sea. It is curious to find these aborigines driven away from the cultivable ground, when we learn that they enjoy even now more rational

* The same objection applies, *à plus forte raison*, to cotton.

A Map to illustrate
Captain Harcourt's Paper
on THE HIMALAYAN VALLEYS of
KOOLOO, LAHOUL & SPITI
with a Sketch Map of
THE PASSES from INDIA to EASTERN TURKISTAN

Scales of English Miles



Published for the Journal of the Royal Geographical Society by J. Murray, Albemarle Street London 1871.

it could well spend some little money on the exploration of Arabia and Somali land.

A plan could be devised which would answer all purposes,—sanitary, military, political, and geographical:—The summer months in Aden are dreadful; we know not which is the hardest to bear, its heat or its dust. Let them march half the garrison out for three months every year, and make a promenade in the hills, with no other object than to get in cool country, give exercise to the soldiers, paying for everything, demanding nothing but full respect. One year to Taëzj, another to the coffee hills of Yaffé, another to Nisab, and so on. The troops would enjoy it exceedingly, the expense would not be immoderate, and I need not say what a beneficial impression such a peaceful but powerful march through this virgin soil would produce on the simple but logical children of Ishmail and Hazra-Mawit.

3rd October, 1870.

IX.—*On the Himalayan Valleys:—Kooloo, Lahoul, and Spiti.*

By Captain A. F. P. Harcourt, Bengal Staff Corps.

Read June 26th, 1871.

The Himalayan valleys of Kooloo, Lahoul, and Spiti, covering an area of over 6000 square miles, and containing close on 100,000 inhabitants, form a portion of the Kangra district, one of the thirty-two into which the Punjab is divided, and lie on the north-east frontier of that province, being bounded on the east by Ladakh, in the possession of the Maharajah of Cashmere, and below that again by Chinese Thibet. It is thus the extreme limit of our dominions towards Central Asia; the name Kooloo, I may add, being a corruption of the old term Koolunt Peeth, "the end of the inhabited world," which it always was considered to be by the Hindoos of the Plains.

Apart from the fact, which geographically is not unimportant, that the Beas and the Chenab, two of the great Punjab rivers, rise in the subdivision; that a third river, the Sutledj, runs for 30 miles along its borders, and that the Ravee, a fourth river, springs from the mountains which close in the Upper Beas Valley—it is to be remarked, that the main Central Asian trade-route winds its way through the districts of Kooloo and Lahoul towards Ladakh and Yarkund, so that, commercially speaking, it cannot be denied that these distant tracts are not unworthy of being brought to the notice of the Members of the Royal Geographical Society, who, from their interest in Central Asia, can hardly be altogether indifferent to a country,

through which filters nearly all the intelligence that reaches us of what is going on in Eastern Turkestan. But if, geographically and commercially, Kooloo is deserving of attention, it possesses other claims to our recognition. Its climate, varying considerably, is totally unlike anything to be found in the Punjab, and probably in India. Its inhabitants, their customs, languages, and costumes, have each and all their special peculiarities; its scenery—here so soft and bewitchingly beautiful, and but a few miles on so stern and rugged—is certainly unmatchable elsewhere in Hindostan; and the religious belief of its people presents but few points of affinity with the creeds that are followed in other portions of our dominions in the East.

In the Punjab the winters, as a rule, are cold, temperate, and bracing, while the heats in summer are nearly unendurable, and the rainy season is moist and most disagreeably hot, except towards the south-west portion of the province, where the fall averages but 3 or 4 inches in the year. Then the various races that inhabit the Punjab present no very great dissimilarities in physique, feature, costume, or language; and though the Hindoos, the Mahomedans, and the Sikhs (these last being only 2,000,000 of the 19,000,000 who inhabited the Punjab in the census of 1867), have all their separate characteristics, yet these are by no means obvious to the casual observer. Again, if we come to the matter of scenery, there is not much that can be advanced in favour of the land of the five rivers. From Delhi to Peshawur stretches a vast plain, fairly covered with arable soil, thriving hamlets, and flourishing gardens; but there is little to relieve the sameness of the extensive table-land, which towards Mooltan, and indeed over a very considerable proportion of the country, fades away into a waterless and unprofitable desert.

The subdivision of Kooloo is made up, as I before remarked, of the subdistricts of Kooloo, Lahoul, and Spiti; all placed under the immediate charge of an Assistant-Commissioner, who has the administrative care and is also entrusted with certain judicial functions.

The three minor divisions of Seoraj, Wuzeeri Rupi, and the Upper Beas Valley, form what we may term Kooloo; but I propose to confine my remarks for the most part to the latter, namely, the Upper Beas Valley. Not that Wuzeeri Rupi and Seoraj are not also worthy of note—for indeed they are—but because they are perhaps less so than the other tracts I shall touch on; and I must perforce condense as much as possible.

A glance at the map will show how either side of the Upper Beas Valley is hemmed in with mountains, which gradually attain a greater elevation as they near the Rohtung

Range that runs athwart it towards the north. The direct road from the plains of the Punjab, which is also the Central Asian route, winds from Kangra, at the foot of the Himalayas, through the Kangra district, across the state of Mundee, and descends by the Bubboo Pass (10,500 feet) into the town of Sooltanpore, from which point we ascend the Upper Beas Valley. The Bubboo is a wealth of richest forest to its summit; but in the other passes, which are more lofty, such as the Malanna (12,000), and the Humta (15,200), even the scrub-jungle that has fought for place as long as vegetation was a possibility, dies away altogether, and is succeeded by mighty crests of rock, battlemented with eternal snow. On the left or west side of the river-way there are also passes over the mountains, but these are seldom used even by the people of the district.

The general aspect of the valley is, as you will imagine, something very unlike what one may find in the plains of India.

The River Beas, springing from a huge rock of limestone on the summit of the Rohtung Pass, tears down the mountain side with impetuous fury, and descending lower, plunges into a deep chasm, flanked by precipitous barriers of rock, not 20 feet apart, and often almost touching. Below, at a depth of over 100 feet, roar the wild waters, as they dash with impotent fury against the sides of the almost subterranean passage that extends for some 300 yards. At the actual foot of the pass the Beas is joined by the Beash Khund, called the Serohi in the maps, and from this point to Sooltanpore, some 25 miles in all, its volume is added to by many feeders.

The river and the valley are in perfect harmony. Sweeping down in grand lines come the mountains, covered almost to their summits with dense pine woods, while ever and anon are to be seen the hamlets of the peasantry, embowered in groves of mighty cedars, the Swiss-like architectural details of the houses bringing to one's mind scenes very far remote from the East. From the river's bank rise successive terraces of cultivated fields of rich green rice; but the sameness is relieved by the luxuriant growth of underwood that breaks the hard lines of uniformity, and thus the waving crops become but an additional feature in the landscape. On every side the giant mountains rear their snowy peaks. To the north, over the Rohtung Pass, can be seen the jagged twin crests of Gaphan, 19,000 feet above the sea; to the north-east are the Humta Spurs, lorded over by Deotiba, 20,417 feet in elevation; and to the west the Burra Bunghal heights, never entirely divested of snow throughout the year. Below, bisecting the valley, sweeps the Beas, bounding over rock and boulder in noisy strength, its silvery tide frequently quite concealed by the umbrageous forest that adorns

its banks—here pausing in peaceful quiet or gliding onwards with a murmuring ripple, and anon racing round some pretty sylvan island, joining its waters again on the further side; and rolling, tumbling, and frothing in many an eddy, whirlpool and rapid, it fights its way past Sooltanpore, where at last it moderates its impetuosity.

Looking down the valley from Menalee, most enchanting views meet us on every side. Mountains rise over mountains, the great army of cedars becoming more and more scattered as the higher altitudes are approached, till there they disappear and snowy ridges break the skyline; nearer, are thick forests of pine and oak, that hold their own with a tenacious grasp on every knoll and coign of vantage, descending in serried phalanxes into the vales beneath, broken or rather relieved by splintered masses of rock, or more pleasantly by picturesque villages hiding like coy beauties in the woodland, that veils and yet enhances their rural charms. Forest, waterfall, headland, and river are blended together in the happiest manner by the lavish hand of nature, which seems to have swept all the most winning aspects from the surrounding districts, but to lavish them on this fair land.

Leaving the Upper Beas Valley we ascend the Rohtung Pass—the first serious opposition that meets the traveller on his journey to Ladakh, or Eastern Turkestan. The ascent from the Kooloo side is steep, but one can ride the whole way, the passage occupying about four or five hours. The summit of the pass is a flat level, half a mile in breadth, and it is the march across this, over a mile in all, which, at such an elevation, 13,500 feet, becomes so very trying at certain seasons of the year. It was on the Rohtung that, in 1863, about a hundred labourers engaged on the works on the Lahoul side, were caught in a terrible storm when returning to their homes. Numbed with the icy cold, and buried in the freezing drifts, no less than seventy-two victims miserably perished. I do not, however, desire to give an impression that this pass is a dangerous one. Far from it; I have crossed it with ladies several times in ease and safety, and, with common precautions, there is no cause for alarm.

We must now enter Lahoul, a very different tract of country to the one just quitted. Looking downwards from the top of the Rohtung we see a sterile land lying at our feet, through which courses the Chundra or Chenab, that seems, at this height, with its chalky tide, to be a mere wreath of snow in the vale below us. The forests, the hamlets, the terraced fields, have all disappeared, and in their places are precipitous hillsides, for the most part even destitute of grass, and furrowed

deep with the accumulations of ice, which have lapped over from the tremendous glaciers that join the peaks together with their adamantine hands.

The mean elevation of Lahoul is about 11,000 feet above sea-level. A glance at a good map of the region will show that there are two rivers springing from the Bara Lacha Pass—the Chenab and the Bagha, the latter joining the Chenab at Tandee after a course of 45 miles. The whole of the interior space between these streams may not inaptly be termed a vast ice-bed, broken here and there by lofty heights of impassable rock and snow. And here the mountains attain to a very considerable height, one of the peaks standing 21,373 feet above the sea-level, and below this towering pinnacle stretch out two glaciers, each over 12 miles in length.

But on both sides of the Bagha, as also of the Chenab, the mountains completely hem in the vales; and, perhaps, to impart a correct idea of the country, I cannot do better than follow the course of the Chenab as it sweeps through Lahoul. The Chenab or Chundra, as it is called up there, rises in the Bara Lacha Pass 16,221 feet above sea-level, takes first a south-easterly course of over 30 miles, and then turns to the north-west to meet the Bagha at Tandee, 80 miles from its source. Leaping from a bed of snow on the south-eastern slopes of the Bara Lacha, the Chundra is, from its commencement, a stream of some size. It passes through a totally barren land, where there are no signs of life, the solemn mountains clad in eternal snow lying on its either flank; and thus ushered into existence under such awe-inspiring auspices, it dashes its foaming waters by glacial banks of snow, vast reaches of grand and decomposed rock, and here stretching into a mighty flood, again subsides to a more stealthy strength, as its icy tide flows onward through a country famed but for sterility, and that colossal grandeur that can only be imparted by vast mountains. Here no villages adorn its banks, no attempts at cultivation, no signs of human life, are to be met with, and nothing greets the eye but the never-ending and monotonous cliffs, which are lapped by the fierce stream as it rushes in wild fury against its banks. Now widening out, the Chundra passes the remains of the Shigri glacier, which some eighty years ago spread across the river and dammed it up, causing what is known as the cataclysm of the Chundra. Leaving the Rohtung peaks behind, some signs of man's habitation are at last to be seen, and, as we advance, villages squalid and forlorn appear, which, on our nearing the junction with the Bagha, become more worthy of remark, surrounded as they are by scanty trees, and a fair proportion of arable land.

The scenery along the banks of the Bagha is so similar to

that of the Chundra Valley, that it need not be here specially referred to. We have now seen two of the valleys, and there remains but a third, which I will also briefly notice. Crossing the Humta Pass from Kooloo, we find ourselves in the Upper Chundra Valley; and marching up this bleak country, taking with us supplies of firewood and provisions to last for a week, we ascend the Koonzum Pass, 14,800 feet, and, emerging from that, enter Spiti, a valley, if anything, more hemmed in by mountains than even Lahoul—not one of the seven passes leading out of the country being under 14,000 feet. In Lahoul trees are to be met with, and, indeed, it can boast of two pine-forests, while the pencil-cedar and the willow are not uncommon; but in Spiti we must be prepared for an almost total absence of arboriculture. The chief stream is the Spiti, which, with a very broad bed, and in many channels, flows far below the alluvial terraces, that can be fed above by ducts brought from the beds of snow on the hill-sides. The main elevation of the Spiti Valley is over 12,000 feet, and several of its villages stand 14,000 feet above sea-level. The landscape views are very grand and striking. From the valley, which is more open than Lahoul, the mountains ascend in gentle slopes, the long reaches of river and bare hill-side dying away into indefinable distance, or being lost in a superb back-ground of snow-capped heights. Such an extent of barren desolation, so totally wanting in all the tenderer aspects to be met with in Kooloo, cannot but forcibly impress the imagination of the tourist, who seems, on entering this land of apparently utter sterility, to have at last penetrated the remotest regions of the inhabited world.

One of the most curious features of Spiti is its inaccessibility, for it can only be entered by passes; and one of these—the Parang La—is the loftiest, I believe, in British territory, standing, according to the measurement of Mr. Theobald, junior, who crossed it on August 13, 1861, at 19,132 feet above the level of the sea. This pass is much used by traders between Ladakh and Spiti, and occasionally by tourists proceeding from Simla to the Pangong Lake. "The crest of the Parang La is," says Mr. Theobald, "a rocky ridge of vertical limestone strata, forming a gap between high snowy peaks on either hand. Below stretches a fine glacier, that fills up the valley beneath; but few crevasses exist in this glacier, which can be crossed without difficulty, the track afterwards creeping along the chasm that yawns between the mountain side and the glacier. The Parang La is open from June till October, but is dangerous at all times, being very liable to sudden and severe snow-storms."

Climate.— The climates of the three valleys, as may be

conceived, differ materially. In Kooloo the spring, summer, and autumn are remarkably genial and agreeable seasons, and although the winter-snows fall heavily in the upper parts of the Beas River, in the lower portion of this district the inclemencies of winter are hardly known. The soil in Kooloo, except in the higher tracts, yields two crops annually. The main crops are opium, rice, tobacco, wheat, Indian corn, barley, and amaranth; but almost any description of grain or vegetable grows to perfection. Fruits—such as the apricot, peach, quince, apple, walnut, and strawberry—are common, and are all good; and there are many others that grow wild, and are held in favour by the people. Nor should I forget to mention the Kooloo tea-plantations, covering about three hundred acres in all, the out-turn of these gardens being justly held in high repute in India, the leaf produced having a flavour quite equal to the best China samples.

In Lahoul spring commences in April, but the snow lies deep in the loftier valleys till near the close of that month. The summer is hot while it lasts, and the rainfall is always very trifling. In September the winter frosts set in, and from the end of December till April the entire country is covered with snow, and almost completely shut out from the rest of the world. The climate of Lahoul may be considered a very dry and bracing one, but towards the sources of the Bagha and Chundra the winds are bitterly cold, blowing like a hurricane all day, and subsiding altogether at night. There is only one annual crop in Lahoul. Wheat is but rarely reared, barley and buckwheat being the commonest cereals. The Moravian missionaries, whose mission-house is at Kielung, where they reside all the year round, and to whose kindly hospitality all travellers can bear the most willing record, have introduced nearly every kind of vegetable. But the people are too lazy to profit by this good example, and are content to put up with the tap-roots, and such-like esculents. Of fruits, there are a few wild strawberries, cherries, and gooseberries; and apricots are sparsely grown, as are walnuts, in the lower Chundra Valley below Tandee.

In Spiti the seasons are very similar to those in Lahoul, but here the winter is longer, and the cold more intense; and, being out of the range of the regular monsoons, the rainfall is quite nominal. The climate is a singularly invigorating one, and at first somewhat trying to those unused to it, and the fierce icy winds make travelling anything but a pleasure in the more northerly portion of the district. The main crops in Spiti are a fine hexagonal wheat, peas, mustard, and two kinds of barley. Of fruits there are none.

Language.—In Kooloo the dialect in common use is formed

out of Sanskrit, a hill patois, and Oordoo. In Lahoul there are four languages—1st, the true Thibetan; 2nd, Boonung, half Thibetan, but having a grammar of its own; 3rd, Manchat, made up of Thibetan, Hindee, and a local patois; and 4thly, Teenunn, in which are Thibetan, Manchat, Boonung, and a few Hindu and Persian words. Each of these languages have their separate localities. In Spiti the dialect is pure Thibetan, hardly ten men speaking or understanding Oordoo, the common language of the Punjab. And even the head man, or Nono, of Spiti (whose likeness I sketched whilst in his district), can only express himself in Thibetan.

Physiognomy.—The people of Kooloo partake largely of the distinguishing features of the Hindus of the Plains. The men are of a medium height, and are strongly built, with intelligent and rather pleasing faces; but in character they are for the most part crafty, dissolute, and lazy. The women are in many cases remarkably pretty, and their picturesque dress sets off their good looks to great advantage.

The Lahoulees are not a comely people; both sexes are short, and the females may be said to bear off the palm for ugliness, the Mongolian origin of the race being evidenced in many cases by the oblique eyes, flat face, and large mouth. In Spiti the men are stout, well-built fellows, and the women are also strongly framed. The great majority of the Spiti folk resemble veritable Calmuks, and are, according to our views, hideously ugly.

Dress.—In Kooloo, the men wear a loose grey woollen coatee, with wide trousers, and a cap of rolled cloth that frequently has a patch of red at the top, and this description of cap is in use also among the women in some of the higher villages. In the Upper Beas Valley the costume of the females is sufficiently peculiar to be deserving of description. The body dress consists of a large plaid gathered in at the waist by a smaller cloth, and fastened across the chest by skewers connected by chains. The use of the chignon is not yet appreciated among these simple mountaineers, but neither do they despise all adventitious aids to showing off their good looks. The hair of a rich brown is swept from the face, gathered into a roll at the back, and then bound round with fillets of red worsted. What hangs below is woven into a long worsted tail that reaches to the ground, and ends in a sort of tassel, but this tail is caught up and carelessly wound round a small light-coloured cap that is jauntily placed on the head. The women of the highest castes never wear the cap, their head-gear consisting merely of a brilliant red, yellow, or blue kerchief; but in either case a great profusion of ornaments in the way of

silver jewellery, and rough stones, are worn. In the summer neither sex wear shoes. In Lahoul and Spiti the costumes in use are, as might be expected from the greater rigour of the climate, much warmer than those adopted in Kooloo. The Lahoulee men and women dress in a long loose dark-coloured cloth, and both sexes wear trousers. The women are bareheaded, but have, by way of ornament, on the top of the head, a curious small silver saucer, garnished with silver and gold beads, and with turquoises.

In Spiti the clothing, although rough, is of the very strongest and firmest material. The men go about in a long grey coat, turned up in some instances at the sleeves with red, and a crimson shawl is commonly fastened over the shoulders, the head-dress being either a skull cap or a species of bag; specimens of all which I brought home. Trousers are worn by both sexes, and the ends of these are tucked into very clumsy-looking leather boots of home manufacture. The women affect a darker cloth than do the men, and they wear a very large quantity of jewellery, besides the *perak,* a loose flap of red cloth extending from the forehead to the waist; this is studded with coarse turquoises or coral. The hair of the Spiti belle demands a great deal of her time, and there, instead of it being the fashion for the ladies to invite each other to spend a long morning and bring their work, they combine the sociable and the useful, and profitably spend their spare hours in arranging their locks, a somewhat troublesome task, consisting as it does in plaiting out innumerable braids, which are deftly arranged over the forehead and then caught up behind. Over each ear is worn a lappet or flap of cloth covered with dyed wool. this apparatus being fastened to the braids of hair. The Buddhist monks in Spiti and Lahoul wear a red or yellow dress, according to their sect, and are generally bareheaded. Each Spiti peasant carries his steel pipe, brass strike-light called a chuk-muk, and tobacco-pouch, and in the folds of his coat are to be found his wooden cup, used in eating, and a sheathed knife.

Houses.—In Kooloo a farmer's house, made in alternate layers of timber and stone, is a very picturesque affair, with its gabled roofs of slate or wood, and overhanging verandahs. Usually there are only two storeys, the lower one being kept for the stalling of cattle, a system also adopted in Lahoul and Spiti, the upper rooms alone being reserved for the proprietor and his belongings. In the early summer the cut corn is to be seen lying loosely about the courtyards, or dangling in great sheaves from the verandahs, which are crowded with the overplus of the ricks below. As summer changes to autumn, the rich green

grass is strewn over each roof and flat surface, mixed with the yellow Indian corn, that is spread in ruddy layers on every house-top. Crowding up from the enclosures, and climbing the rude scantling, come the pumpkins with their vast emerald-green leaves and enormous golden flowers, and pausing on the roof-tree to deposit their tribute fruit, they pass over and descend by friendly poles and verandahs across the road, to meet some other greenery of wild beans or vines that may have trailed up the adjoining tenement. Within, the women and children are to be seen engaged in household duties, or leaning over the quaint verandahs eyeing their friends below employed in turning about the hay, or pounding with a will at the rice cleansing, or pressing oil from the kernels of apricots, peaches, or vegetable herbs.

In Lahoul there is but little to deserve notice, the houses as a rule being poor and meagre-looking, and so we may pass on to Spiti. In this bleak valley, where the snow-fall is so heavy, we find the houses exceptionally comfortable and substantial, the walls being of sun-dried bricks, 1½ feet long, 8 inches wide, and 6 deep. Below they stall the cattle and stack the supplies of fodder for the winter, and in the upper apartments reside the goodman and his family. The roofs are all flat, and are covered with layers of dried brushwood for winter use, these accumulations of bushes presenting a curious appearance, something like an *abattis*. The Spiti men are very kind-hearted, good-humoured, and hospitable, and rank highest of all the hill people I have met with in good-natured simplicity, thrift in conducting their affairs, and in faithfulness to those who have occasion to utilize their services.

In Kooloo we find a debased Hinduism built up on a superstructure of Buddhism and snake and tree worship. The temples that for the most part have their regularly-feed priests, are of three different sorts: the cone-shaped stone temple, the pagoda-roofed temple, and the pent-roofed temple. The former are very similar to what may be seen in the plains of India; and, although of stone, but few can claim an age of more than 250 years; the pagoda temples are, as are probably the pent-roofed ones, but relics of Buddhism, as is abundantly manifested by the lofty poles erected without their walls, that answer to the same Buddhist symbols in the Ceylon temples of the present day, and by the Buddhistical carvings of wheels, animals, and snakes, the worship of which it is known Buddhism incorporated with its own religious services. These two last descriptions of temples are of great age, and are not a little curious in an artistic and archæological point of view, being

very massively put together, and run up with a skill which no longer can be said to exist in Kooloo, where, indeed, all handicrafts are in a very backward condition.

In Kooloo, Buddhism has quite died out, leaving, as I have said, a substratum of tree and serpent worship engrafted on Hinduism. In Lahoul, however, there is Buddhism and Hinduism mixed, and with these two creeds is commingled a species of demon worship termed long paechos, in the rites of which neither Brahmins nor Buddhist lamas will assist. But in Lahoul the Buddhist believes in Hinduism, and the Hindu in Buddhism, and in the event of any of the better class requiring the aid of the supreme power in the matter of a good harvest or a fortunate speculation in trading, the ministers of both creeds are called upon to invoke the deity. The priests in Buddhistical countries are, as I suppose most know, termed lamas, or more properly *lambas*, and while the eldest son succeeds to the estate, every other son becomes a *lamba*, so that the priestly class must always be in the majority. These lambas are supposed to be celibates; but in Lahoul, Buddhism is not strictly acted up to, and many of the younger sons marry. In Spiti, pure Buddhism reigns, and here every younger son is a lamba.

In Lahoul there are only seven real lambas who devote themselves solely to religion, but there are 1100 lambas in all, who for the most part are married and are "religious" only in name. In 1868 there were over seventy nuns in Lahoul, and one of these could actually calculate an eclipse! The parents decide when the girl is young if she is to be a nun, and if she enter a religious order, her hair is cut short and she wears a red cap, and resides during the winter in the monastery, generally ending by marrying one of the monks!

Marriage in nearly every country is connected with religion, but in Kooloo marriage is merely a civil contract. In one house you may find a man with only one wife, in the next there may be three wives to one husband. Marriage, in fact, resolves itself in the main into a question of means; those who can afford it have more wives than one, for women in the hills are valuable as farm labourers, and the greater the number of wives, the more work can be got through.

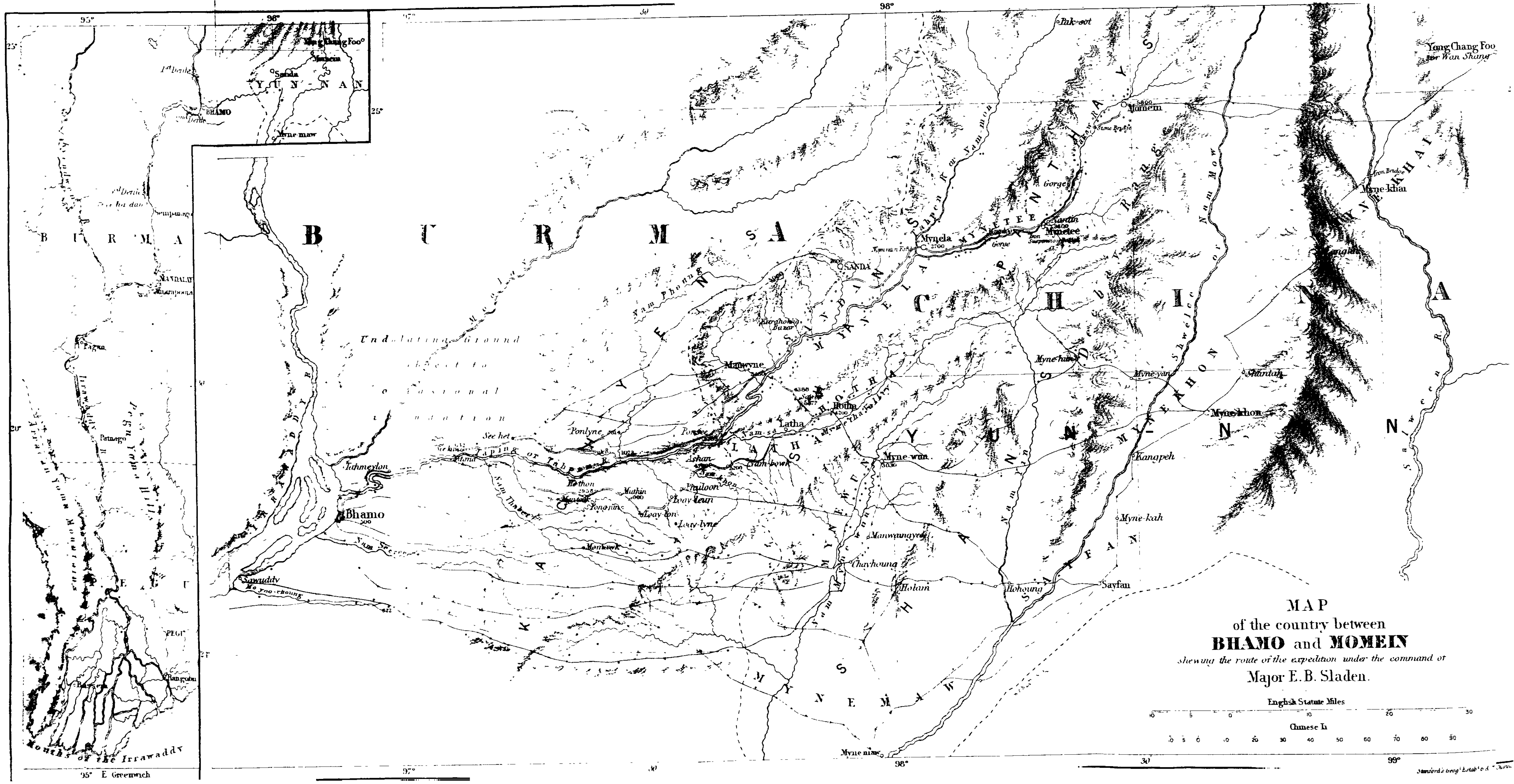
In Lahoul, polyandry is a custom in full force, and three or four brothers as a rule have only one wife between them, as is the case in most Buddhist countries, though strangely enough not in Spiti, where the husband has only one wife whom he marries by a regular religious ceremony, whereas in Lahoul there is no ceremony at all.

I have referred to the Kooloo temples, and I cannot altogether omit mention of the Buddhist monasteries in Lahoul and

Spiti. In the former district these are few in number and small in size, but in Spiti there are five large *lamaserys* besides numerous offshoots. The monastery of Kee, for instance, accommodates nearly 250 monks, who reside within the sacred walls in winter, and stay during the summer with their parents or brothers, working in the fields, or employed in carrying travellers' goods. These monasteries have their regular heads or abbots, and the higher ecclesiastical titles can only be obtained by the candidates proceeding in person to either Shigatzee or Lhassa. The symbols of this strange religion, which inculcates peace and goodwill to all men, and prohibits all destruction of life, are numerous and interesting, and some of these I brought away with me, together with a somewhat curious box of Buddhist gods which I purchased in Lahoul, and which I was informed was brought from Lhassa, a city three months journey from Spiti.

In close connection with the religion of the people of Kooloo, to which tract I again turn, are the fairs or melas held in honour of the local gods, which fairs are however utilized more as a means of affording amusement than from any deep sense of religion. At these gatherings, nothing is sold except a few bright beads or coloured scarfs; people do not attend the melas to spend money, but to dance and sing and thoroughly enjoy themselves; and, as far as my experience goes, I can affirm they all manage to do that in such a manner that there is no room for the reproach launched against us Britons, *i. e.* that we take our pleasures sadly.

The scene is a highly attractive one. The village divinity is brought from his temple or god-house, decked with a gold mask and tricked out with petticoats, peacocks' feathers and flowers; then, placed in his *rath* or sedan-chair, he is carried through the dense woodland preceded by men beating drums and breathing villanous music from enormous trumpets. Behind follow the males in procession, every one being decorated with garlands. Arrived at the temple, generally situated in some beautiful dell in the forest, and lying under the giant cedars, the rath is placed on one side and a space is cleared for dancing within the sacred precincts. The musicians set themselves in the centre, and the dancers move round them in a circle, and as the noise of the pipes and drums increases, the performers work themselves into a proper enthusiasm, and all following the motions of a fugleman, commence a species of nautch-like movement, the wands with which they are all provided being waved simultaneously as the leader may direct. The gestures are not ungraceful; they are the contrary—grace carried to absurdity, and every dancer endeavours in the most


MAP
of the country between
BHAMO and MOMEIN
shewing the route of the expedition under the command of
Major E.B. Sladen.
English Statute Miles
Chinese Li
BURMA
CHINA
YUN-NAN
Bhamo
Momein
Yong Chang Foo
Mynela
Manwyne
Sanda
Latha
Hotha
Myne-wun
Myne-khon
Myne-khai
Kangpeh
Myne-kah
Sayfan
Hohoung
Holam
Chayhoung
Manwangyee
Ponlyne
Ponsee
Ashan
Phaloon
Loay-leun
Loay-lyne
Sawuddy
Tahmeylon
Pak-sot
Myne-nian
Undulating Ground
subject to
occasional
inundation
Taping or Tahpan R.
Nam Phoung
Nam Mow
Shweli
Salween R.
Mandalay
Pagan
Patanago
Rangoon
PEGU
Mouths of the Irrawaddy
95° E Greenwich
97°
98°
99°
Stanford's Geog! Estab!

ludicrous manner to excel in pose and the elegance of his attitudes. All are dressed in their very best clothes, and the women don every particle of finery they can lay their hands on. Both sexes are literally covered with garlands, and it is altogether a very brave show and brilliant spectacle. As the men dance, the women and children in evident admiration sit gazing down on them from every house-top whence a good point of view can be obtained, and a more striking picture than is at this time presented can hardly be conceived. Meanwhile the priests, *i. e.* Brahmins, are not idle. They take off their upper garments, advance with a sidelong step, going through certain mummeries with incense and naked swords, and after gently chastising themselves with chains, taking very good care not to hit too hard, they are then supposed to be properly inspired, and stand like Delphic oracles, ready to answer any questions the gaping crowd may put to them.

X.—*Expedition from Burma, viâ the Irrawaddy and Bhamo, to South-Western China.* By Major E. B. Sladen, H.M. Political Resident, Burma.

Read June 26th, 1871.

THE Expedition which I had the honour to command left Mandalay by steamer on 13th January, 1868. One of our objects in proceeding by steamer was to test the navigability of the Irrawaddy for steam-traffic beyond or above the capital. Hitherto no steamer had ever ascended the river as far north as Bhamo, and the Burmese Government had publicly declared that no steamer could possibly do so at that time, or during certain seasons of the year, when the river was said to be at its lowest depth. Our steamer, however, the draught of which did not exceed 3 feet, reached Bhamo without difficulty of any kind in river navigation; and the result of our trip proves generally that the Irrawaddy is navigable for steamers of moderate draught at all seasons of the year, as far north as Bhamo, a distance of 900 miles from our starting-point at the Port of Rangoon, and 300 miles above the royal capital of Mandalay.

Throughout its whole course from Mandalay to Bhamo the river presents fresh scenes of ever-varying beauty; but the geographical interest of the journey culminates at the gorges or defiles which occur at two points in this portion of the Irrawaddy's mid-course through Upper Burma.

The following brief remarks on the third,* or most southern, of these defiles, about 60 miles above Mandalay, are extracted from my rough note-book, and were jotted down, I remember, on the spot, as my boat glided down the river on our return journey from Bhamo.

"*September 19th*, 1868.—Passed Sempanago at 11 A.M., and immediately afterwards entered the third defile. It seems endless, and, as far as appearances go, is so shut in at each bend in its course as to deny the possibility of exit altogether. Looking north and south from Thee-ha-dau,† the view is strikingly beautiful. The water is smooth, placid, and without a ripple. The scenery is no longer that of a river, but bears all the characteristic aspects of a mountain-girt lake. Does it bear any resemblance to the lake-scenery of Europe, or to some of the views presented on the Rhine in certain portions of its course? I think it does; but, if so, there are also many wide diversities. Here, at least, palm-trees of every variety rise above the banks. The forest-trees, on either side, are either hidden by orchids, or their branches are borne down by a network of gigantic creepers. Graceful pagodas and Buddhistic remains seem full of an inspiration of their own, as they reveal themselves at each turn in prominent but yet modest profusion. Parrots flit across the scene with a screech, and monkeys form our escort on the banks. Dolphins occasionally pop up on the surface of the water, and turn themselves over with a lazy roll. Surely this is not Europe! We are in the tropics with a vengeance, and the thermometer in my boat stands at 90°," &c.

The second defile, which occurs only a few miles below Bhamo, is so graphically described by a traveller who passed through it in November last‡ that I cannot help quoting a few extracts from his narrative. He says:—"About 11 o'clock we entered the second defile, which is about 15 miles in length. The scenery of this defile or gorge surpasses anything I have ever beheld. The river narrows in, whilst the banks on either side rise to a height of from 500 to 800 feet, and are covered with thick woods. The most striking part of the defile is a huge rock, which is called Monkey Castle, from the number of monkeys which hang about it. This is a vast perpendicular mass, rising apparently at least 800 feet above the glass-like river. It is impossible to describe our impressions of the grandeur of this wonderful defile. During the couple of hours we were passing through, there was a continual change: sometimes the stream took a winding course between the elevated

* The first occurs about 10 miles north of Bhamo.
† A village on the right bank, where coal is found.
‡ Mr. Talboys Wheeler, Secretary to the Chief Commissioner of British Burma.

and precipitous banks, with their towering forests; at other places we came upon a long vista of wood and stream. Here and there was a pagoda, or a village, or a few fishermen in a boat. On the whole, I do not remember any scene so calculated to please and astonish the eye—not by rude, wild precipices, but by glorious heights crowned with forests, and throwing their dark shade upon the smooth water."

I have already mentioned Thee-ha-dau, a village within the third defile, where coal is found at several outcroppings not far from the river bank.

This place is otherwise famous for a large species of cat-fish which have been tamed by the Buddhist priests, who inhabit a monastery on a small island in mid-stream near which the tame fish are always to be found.

Dr. Anderson who accompanied the expedition as naturalist, has thus rather playfully described his first interview, or intercourse, with these tame fish.

He tells us, "that one of the chief interests attached to Thee-ha-dau are the remarkably tame fish, which come to be fed whenever they are called. We went (he says) provided with rice and plantains, and the boatmen who accompanied us immediately began calling out Tit, Tit, Tit. In a few moments we noticed a disturbance of the surface of the water, and after reiterated cries of Tit, Tit, Tit, the fish came to the bank and commenced devouring the rice and plantains we threw to them. In their eagerness to be fed they protruded their large uncouth heads, and even a great part of their backs, above water; and, with their capacious mouths wide open, waited patiently for the handfuls of food, which they swallowed without returning to the water. I stroked them down the head and back, and pulled their long feelers without giving offence. I put my clenched fist in their mouths, but on reflection desisted from this hazardous mode of investigation; for had one closed his mouth, I should certainly have had to follow him, *nolens volens*, into the water; and it is difficult to say what treatment I might have experienced there, with their appetites and their palates fresh from the memories of uncooked rice, and lusciously ripe plantains."

The expedition reached the Burmese frontier town of Bhamo, from which it commenced its land journey across the Kachyen Hills, in a north-easterly direction, towards the Chinese frontier province of Yunnan.

Bhamo itself (called and pronounced on the spot Bhamāw) was, only a few years ago, the emporium of a large trade between Burma and south-western China. The cessation of that trade brought about by a Mahomedan rising in Yunnan on the one

side, and the almost simultaneous occupation of Pegu by the British on the other, affected the progress and prosperity of Bhamo to such an extent that, from having been a place of comparative importance, it had dwindled down into insignificance, and at the time of our arrival contained only 500 houses, and a mixed population of Burmese, Chinese, and Shan Burmese, which did not exceed in all 5000 souls.

Our own stay at Bhamo ought not to have exceeded a few days, during which preparations would have to be made for the land journey beyond; but the perversity of circumstance, and the anomalies of native governments or native officials, detained us in indolence and anxiety for nearly six weeks.

I must illustrate some of the difficulties of this period by a few random extracts from my rough notes, and official narrative of the expedition, since published by Government.

"On 22nd January, the day after our arrival at Bhamo, the two Tsitkays, or head men of the town and district, paid us a visit on board the steamer. They were courteous, but exceedingly reserved as regarded the subject of the expedition. They specially ignored the existence of all orders from the capital which directed that preparation should be made for our reception at Bhamo, or for our journey onwards, &c., &c.

"It was not very encouraging to us to be informed by these officers of the Burmese Government that the only routes eastward, across the Kachyen Hills, were effectually closed against transit of every kind—or to learn two days later, after notices had been sent to the hill chiefs, who held the only supposed practicable line *viâ* Ponlyne, that they refused to recognize the summons of the Burmese Tsitkays, and required written orders from the Governor himself before they consented to come to Bhamo, or enter into preliminaries relating to our journey across their hill territories. The old Governor had only recently been murdered and the advent of a new one, depending as it did on Burmese caprice, made it a matter of extreme uncertainty whether the written orders required by the hill chiefs could be forthcoming at any reasonable period during that cold season.

"There was further cause for discouragement, in the fact that, owing to certain differences which existed between the Burmese inhabitants and the Kachyen Hill tribes, which inhabited the hill country around, Kachyens were positively interdicted from entering Bhamo; and that thus the very people whom we had come to conciliate, and by whose friendly assistance alone it was possible to carry out the purposes of the expedition, had been induced by our connectionship with Burmese officials to look upon us as something akin to natural enemies.

"On 23rd January, I returned the official visit of the two Tsitkays, and at the same time was introduced to an old Chinese gentleman, who was specially allowed to exercise jurisdiction of some sort over his Chinese brethren located at Bhamo.

"The officials were courteous as ever, and received me with as great a display of dignified hospitality as the impromptu nature of the occasion admitted. But however impressive this may have been in one sense, the interview disclosed with powerful apparency that no effort was being spared by which to discourage and destroy, by plausible argument, every hope we might hitherto have entertained of reasonable success in the undertaking we were then committed to.

"The Kachyens were described as treacherous and intractable. They were represented as disinclined to allow transit of any kind to foreigners across their hills. Though nominally subject to Burma, they professed to be independent, and lived, it was said, in a state of indiscriminate feud amongst themselves, and by general depredation on the villages or property of their immediate neighbours.

"The country beyond the Kachyen Hills, as well as the whole Chinese frontier, through which our route lay, had lapsed into a state of dangerous disorganization, and was infested and preyed upon by large bands of marauders, who, having first submitted during a state of anarchy to being despoiled themselves, were now compelled in turn to obtain a livelihood by a reckless spoliation of others. The head Chinaman asked me with bitter significance, 'How do you expect to succeed in a project which kings have attempted and repeatedly failed in?'"

But it is needless here to enter into the history of our six weeks' detention on the Burmese frontier. The narrative would serve only as a comment on the fertility of native intrigue, by which the very Government which directly professed to assist our mission, indirectly sought to make that assistance nugatory by the semblance of difficulties within its own control, or arising in chief part out of its own creative design, or the resources of its too lively imagination.

For some reason or other, which I shall not at present try to account for, every attempt at exploration across the forbidden tract which lay between Burma and China had hitherto failed. This opposition appears to have been equally effective on both sides of the frontier, and as actively maintained by both the Burmese and Chinese Governments, for reasons for which they would doubtless find no difficulty in affording a satisfactory explanation.

I have it, on the authority of Don Abbona, a Catholic missionary priest, who was then in communication with his co-religionist associates in China, that Father Chauveau, now a bishop in Thibet, made three unsuccessful attempts to cross over from Yunnan to Momein. In these attempts he used considerable effort, and went so far as to avail himself of different disguises; but baffled everywhere he was compelled to desist, and relinquished all hope of reaching the Burmese frontier.

I have already said that our route, on commencing the land journey from Bhamo, took a north-easterly direction across the Kachyen Hills, an irregular transverse range of mountains, with an average breadth of 50 to 70 miles.

As seen from Bhamo, this great hill-range would appear to be only a continuation of the central Shan ranges which occur to the eastward of Mandalay. On examination, they turn out to be nothing more than secondary ranges, with an inclination E.N.E. and S.S.W., forming well-defined valleys, and determining the course of three of the principal affluents of the Irrawaddy in its mid-course through Burmese territory (the Moolay, Taping and Shwélee).

These subsidiary ranges terminate abruptly, on their eastern and southern extremity, within a few miles of the east bank of the Irrawaddy; and the intervening space between their abrupt termination and the river is composed of low undulating ground, subject to occasional inundation, and alternately covered with high grass, low jungle, and occasional clearances with rice-cultivation.

But at their north-east extremity these same subsidiary ranges (confused and chaotic as they are as regards direction and configuration within the belt or zone known in Burma as the Kachyen Hills) open out into long, well-defined parallel ranges, with richly fertile and naturally exceptional and picturesque valleys, within which lies, and which in themselves comprise, the country hitherto only vaguely known to us by name as the Northern Shan States.

Pursuing these same ranges to their north-east extremity, we found them terminate or rather merge into the great central ranges of Yunnan, which, as seen from Momein, we estimated to attain to an altitude of 15,000 feet, with a general north and south inclination, and forming, no doubt, the principal watershed between the basins of the Irrawaddy and Great Cambodia (Mékon) rivers.

It is important to bear in mind this peculiar configuration of the country which intervenes at this point between Bhamo and the Chinese frontier, for it solves in great measure the very

important problem of an overland trade-route which is to connect these two countries; and proves, moreover, I think, that the Burmese and Chinese populations and Governments, at a time when trade communication flourished in these parts, had both observed and availed themselves of the natural advantages of position and facilities for transit, which were presented to them by following either of these valleys,—which, by directness of course, general inclination and position, so invitingly held out the means of intercommunication and commercial intercourse between their respective countries.

It is further interesting, too, to note this configuration, because it discloses a geographical certainty, which nothing but exploration could possibly have solved.

I can well remember during several years' residence at Mandalay, and more especially during our six weeks' detention at Bhamo, trying in vain to imagine to myself, even with the aid of abundant enquiry—trying in vain, I may say, to form any definite idea in my own mind of the conflicting accounts given to us of the Kachyen Hills and the country which lay beyond them. Doubts are now solved, and we hold the proofs of personal observation.

I must again have recourse to extracts from my rough notes and official narrative of the expedition as the readiest and shortest means at my disposal in attempting a brief description of the country we passed through, its inhabitants, and some of the incidents of our land journey as far as the Chinese walled city of Momein; but before I do so, let me say a word or two about the different races whose names repeatedly occur in my narrative, and of whom no succinct details have hitherto been published. I shall refer, first, to the Kachyens; secondly, to the Shans (of the Northern Shan States); and thirdly, to the Panthays, or Mahomedan Chinese of Yunnan.

The Kachyens of Burma are identical with the Singphos of India, or rather the Singphos of the hill-districts which intervene between Burma and Eastern Bengal on the north, including Assam. "Kachyen" is merely the Burmese name given to these hill-tribes; but wherever we came in contact with them, although broken up into a number of distinct tribal denominations, they always preserved the general term of Seng-Phaw, which they said applied to their race as a whole, and must be regarded by us as a clear indication of their identity with the Singphos, and probably also the Kakoo hill-tribes who range as far north as the borders of Assam.

Eastward, too, these Kachyens occupy most of the hill-tracts as far as Momein. In Burma they are spoken of as wild,

ferocious, and intractable; but this arises out of ill-treatment and the aggressive exactions of Burmese officials on the one hand, and retaliatory raids made by the hill-tribes on the other. In the Shan States, where the Kachyens are better understood, and live on terms of equality with their Shan neighbours, they are friendly and peaceably inclined, commit no excesses, and attend in numbers as sellers and buyers at markets, which are regularly held at several towns within the country known as the Northern Shan States.

Our own experience of these Kachyens is, that, under proper treatment, they proved themselves to be kind, tractable and intelligent, with a certain admixture of truth and treachery, which is inseparably connected with semi-barbarous nature all over the world. They are keen traders, work cheerfully for gain, and are hospitable to strangers. Their religion consists solely in the propitiation of good and evil spirits, by sacrifices, and observances too numerous to mention. It may be stated, however, that mountains, valleys, trees, lakes, and even the sun and moon, are under the influence of presiding deities, or nats, all of which exercise power over the destinies of mankind, and demand propitiation. Ghosts are invariably believed in: they are said to be the spirits of those only who have died a violent death; they assume monstrous shapes, and are always dreaded as messengers of evil.

The Shans generally have been variously described by different writers who have visited the Southern Shan States subject to Burma, or the Siamese Shan States bordering on Siam; but no European traveller, previous to our expedition of 1868, seems ever to have come into contact, in their own country, with the Northern Shan States, which lie within the province of Yunnan.

Within these states we found Shans proper, who occupy the Sanda and Nantin valleys, and Mynetha Shans, who are confined principally to the Hotha and Latha valleys. The latter have a distinct language of their own, and their dress and other characteristics proclaim a Chinese admixture, in a similar degree to the Burmese admixture so traceable in the Shan races bordering on Burma. The wonder is, that, hemmed in as the Shans are by such distinctly pronounced nationalities as the Burmese, the Siamese, and the Chinese, they should have preserved so many distinctive characteristics of race, or that they should not have merged entirely into one or other of the great nationalities by which they are everywhere surrounded.

The Panthays are Mahomedan Chinese, who, being formerly subject to the Chinese Government, have within recent years

risen in insurrection, and proclaimed their independence throughout the greater portion of Yunnan on the south, and the provinces of Shansi and Kansu on the north.

Their historical origin is somewhat indefinite; but most accounts of them, given by themselves, agree in the fact that originally they emigrated, or were sent over as a war contingent from Central Asia to assist some remote Chinese emperor in repelling a Chinese invasion. A return to their own country having been impracticable, the Central Asian contingent intermarried with the Chinese, and for centuries past have been scattered abroad through different provinces of China, where they have managed to preserve a Mahomedan religion and nationality, and become powerful enough, as at the present time, to establish in different parts of the country a separate Mahomedan government.

It was by the friendly and active aid of these Mahomedan Chinese that our expedition was enabled to reach the city of Momein, then in their possession; but, having cleared the way thus far, I shall now return to that expedition, and commence with a short description of our start from Bhamo on the 26th February, 1868.

The 26th February is a day to be remembered in the history of our expedition. On the 25th our baggage had been despatched by boat up the Taping River to the village of See-kaw, where mules were engaged to be in readiness to transport us across the Kachyen Hills as far as the Shan town of Manwyne.

The officials failed in their promise to supply us with porters or guides, although they knew the latter to be indispensable, as the first portion of our march lay through dense jungle, which was intersected at short intervals by branch roads, which led no one knew where, and a broad unfordable river would be encountered, and could only be crossed by pre-arrangement entered into with Burmese officials. However we got off at 10 A.M. with incomplete attendants and no guides. A Burmese petty official was caught by accident as we rode through the town, and persuaded into accompanying the party, after carefully stipulating that I would use my influence at the Burmese headquarters to screen him from after punishment for having given his aid to the British expedition.

It was owing to this aid that we were enabled to reach the village of Tahmeylon at 2 P.M., where we settled down at once into comfortable quarters in a deserted monastery (Phoongyee house), amongst model shrines carved in wood and inlaid with variegated looking-glass, a library of religious books, sacred alms-bowls, and complacent images of Gaudama in every variety of shape and profusion.

The baggage-boats which left Bhamo the previous evening, passed up the river during the afternoon towards our proposed halting-place at See-kaw, which we reached ourselves on the following morning (27th February), and found there our mules and mule-men, with a few Kachyen chiefs and their Pawmynes, or deputies, who were afraid to trust themselves further in the vicinity of their Burmese oppressors at Bhamo.

Four days were passed in arranging with mule-men at See-kaw. The mules belong generally to petty proprietors, each of whom considers himself an irresponsible agent, with whom separate agreements have to be made in all that relates to the hire of his particular property. But as soon as the hire had been effected, new difficulties commenced. The baggage was made over to the Kachyen chiefs, and passed in review by the several mule proprietors, who at once raised a clamour as to its apportionment into allotments. This clamour, in which we took no part, seemed likely to end in a breach of agreement, and caused repeated threats on the part of the mule proprietors to leave us without carriage altogether.

I was obliged to depend almost entirely at this time on the Kachyen chief, Ponlyne, and a Chinese interpreter, Moung Shoay-yah, who had been specially made over to me by His Majesty the King of Burma. Both were occasionally drunk; but this was of no consequence, as drunkenness appeared to be the normal condition of all Kachyen chiefs when on duty, and was not regarded by them as in any way an interruption to ordinary business.

The expedition did not get away from See-kaw until 2 P.M. on 2nd March. Three Kachyen chiefs lead the way, the mules follow, and the police armed escort is told off to ammunition and cash-chest.

The route lay in a northerly direction, through paddy or grass fields, for a distance of three miles, as far as the small village of See-het; but here we turned abruptly to the right, and commenced to ascend a steep spur of the Kachyen Hills, leading to Ponlyne. We had headed our baggage, and a temporary halt took place.

The three Kachyen chiefs, who had preceded us from See-kaw, were here seated evidently in deep counsel, and much excited. As I came up, Ponlyne ran to meet me, and pointed out the road up the ascent, exclaiming at the same time "All right! go on; don't be afraid."

This was rather puzzling; for, hitherto, there had been no cause for apprehension of any sort.

But on we went. My pony was a good climber, and led the way. After ascending the hills some two miles, a shot was fired

some distance in our front. I waited until Dr. Anderson had joined me. A second shot; then four shots all at once, but no sound of a bullet. The Kachyens of our party were most of them drunk. They shouted like fiends, and urged us to fire off our guns, which we refused to do, but went on as if nothing had occurred.

One of these Kachyens was mounted on a mule, and became more dangerous at close quarters, as a friend, than any number of our supposed enemies at a distance in the bush. In his excitement he flourished a long sharp sword, in reckless disregard of every one but himself. He became a still more formidable animal when the sword was sheathed, and his matchlock brought into active operation. Drunkenness seemed only to steady his movements, for, though riding over a road particularly rough, and in many places a steep incline, the matchlock was, nevertheless, loaded and fired, with wonderful precision as regards time, but utter recklessness as regards direction. The man was both friendly and quarrelsome at the same time. A word out of place would have turned him at once into a foe, and the only way of keeping him in good humour with himself, and with us, was to praise his dexterity, and promise to renew his exhausted powder-flask as soon as we arrived at the village we were journeying to.

I shall now read from my diary our first day's experiences on the far-famed Kachyen Hills at Ponlyne.

"*March 3rd*, 1868.—Reached this place late last night. The Pawmyne conducted us to a native house, which had been specially set apart for our accommodation. None of our baggage had arrived; but there was a novelty about the scene and occasion which atoned in some measure for the absence, after a long march, of either bed or supper.

"We stroll out and watch Kachyen women pounding paddy by moonlight. An old lady of the party beckoned to me to follow her, and I was conducted, with a thrill of ambiguity as to results, to a house at a little distance, where I found the Ponlyne chief himself, surrounded by his family. It was a novel and interesting picture. The chief made me share his own carpet; the rest seated themselves on blocks of wood or pieces of bamboo, and certain members of the family attended us with relays of Kachyen beer and Chinese shamshoo.

"This morning we are informed that a portion of our baggage, including ammunition and cash-chest, has been looted by the Kachyen chief of Tahlon. As the day wears on matters improve. We find that the mule-men, who were supposed to be missing, have merely herded together for the night at their own pet halting-places.

"The Jemmadar, with the escort, arrived at 1 P.M. The Ponlyne chief has sent his own son to release our ammunition and cash-chest, which are being unaccountably detained by the chief of Tahlon. When they arrive, we shall have lost nothing of consequence, though things looked awkward at first, and the expedition was in danger of coming to an abrupt termination after its first march.

"The chief's wife has paid us a visit in great state, attended by her family and a number of female companions. She brings presents of geese, boiled rice, eggs, and Kachyen beer (called Sheroo). She is a fine, intelligent, matronly-looking woman, and the 'get-up,' though a little *outré* at first sight, is by no means unbecoming. The head-dress consists of a black cotton scarf, with silk-embroidered ends, which is wound round the head as a turban and made to ascend a foot in height, in the shape of an inverted pyramid. The upper garment is a loose black velvet jacket, studded here and there with large silver embossments, which encircle the neck from behind and are continued in lines down the front and round the skirt. The lower garment is a single dark-blue cotton cloth, about a yard and a half in length, which passes once round the body from the waist to the knees, and is fastened in front with a simple tuck. It is edged at one end with a red woollen border, a foot in depth; and this decorative part of the garment is allowed by all Kachyen women to dangle on one side, with an effect which to Kachyen comprehensions is doubtless very captivating.

"During the day we heard sounds of Kachyen music, and, going in search, arrive at a house on the outskirts of the village in which men, women, and children are dancing vigorously to a rattling accompaniment of gongs and sticks, beaten by themselves. They do not object to our presence, and Anderson and I enter the house and join in the dance, which is a measured side-step with side-movement, crab-fashion. We go round in our proper places, and are enjoying a certain wild novelty in the arrangements, when suddenly the male dancers become wilder than ever, and rush madly out of the house like demons; we remain inside with the women. The scene of excitement has given place to wailing and lamentation; two of the women retire, and we see them crying piteously over the corpse of a child, which has been carefully concealed in a side apartment. The dance was a death-dance, and we, too, have joined in it, and thus helped, according to Kachyen belief, to drive from its late tenement the hovering spirit of the poor dead child. We sit down mournfully, and our female hosts hand round Kachyen beer in conical cups of plantain-leaf, which have been ingeniously improvised for our special benefit."

We did not leave Ponlyne village until the 5th of March. On the 4th the chief informed me that the nats, or spirits of good and evil, looked unfavourably on us, and required propitiation. This merely implied a demand for rupees. We accordingly accompanied the chief to his house, where we found all in readiness for a special ceremonial. The spirits of good and evil were about to be consulted through a Kachyen medium, or priest, who had separated himself for this purpose from his companions, and occupied a dark corner at the extreme end of the building. Here he crouched down and began to work himself into a fury of attitudinizing, stroked his head and face with both hands, tore his hair, sighed, moaned, groaned, and, finally, his legs, from the knees downward, were made to quiver, with a reverberation which repeated itself on the bamboo flooring with a sharp castanet-like sound, which was kept up incessantly during the remainder of the ceremony. We knew at once that the man was at last possessed, and beyond all self-control. His utterances, henceforth, were believed to be those of demons and nats, in a fury of anger, which promised even violence.

The chief whispered and asked for my propitiation. I put down 15 rupees, which were offered up on a platter made of plantain-leaves; but in a moment platter and rupees had been scornfully kicked to a distance. The chief approached with reverence and begged that the offering might not be rejected. No reply, but more groans and further evidences of dissatisfaction. I am appealed to and add five rupees, which was all that was wanted. The offering now finds favour and is accepted. Benedictions follow, and all that is good is prognosticated in our future travels.

We got off from Ponlyne on the 5th March. The route lay along the valley of the Taping. Every now and then the view was glorious. On either side hills towered up into mountains, and range after range succeed each other, apparently in endless continuity, till lost in the blue distance.

The village of Ponlyne is about 2320 feet above sea-level. The immediate descent from Ponlyne to the bed of the Nambouk River was steep and difficult for a distance of three miles; but the next four miles was occupied in crossing a succession of lofty spurs which abut into the valleys from the main ranges. The Taping River is constantly in sight; at times we descend almost to its bed, and anon it is roaring 2000 feet below us. It is, in this part of its course through the hills, a broad mountain-torrent, or rather a continuation of rapids, down which the water rushes with unceasing roar, and with a force which nothing could withstand, if we except prodigious boulders of granite, which lie occasionally across its bed, or hang suspended on its

immediate banks, with an inclination that suggests an inevitable downfall.

We encamped for the night in jungle, and started the next morning for Ponsee, which is ever memorable to us as the scene of our weary detention—I may almost say imprisonment—for a period of more than two months. I shall not attempt to describe the troubles, the discomforts, the vexatious annoyances to which we were subjected during the whole period of this detention. We were cut off from communication on all sides. Our means of advance or return were taken away, by the preconcerted withdrawal of our mules. The enmity and resentment of the hill-tribes around us had been roused and encouraged by the most villanous reports of our objects and mission. Armed attacks were often threatened, but as often avoided. Time alone was our friend, by affording proof that in all our actions and intercourse with these new races they were gradually made to feel the genuine honesty of our intentions, and the friendly policy of the British Government.

I will here pass over ten days of inaction and quote from my diary of 17th March :—"Difficulties increase. The chiefs come early and pass several hours in small talk. The demand for old-mule hire has risen from 20 to 25 rupees per head. I offer 500, if carriage is procured as far as Manwyne. The chiefs reply—'You cannot go to Manwyne. The roads are held by armed men, who have been sent to oppose you. Lee Sheetahee (a well-known brigand chief) holds the pass at Mauphoo, and he has sent orders to all the Shan chiefs, and warned them not to allow you free transit,'" &c. &c.

But whilst engaged in conversation with the chiefs a shot was fired from a house in the village above us, and one bullet whizzed over our tent, whilst another struck a camp-cot inside, on which some of our party happened to be sitting. It was not until a second shot was fired that the Ponlyne chief got up and vociferated like a madman. Five minutes afterwards he informed me of his intention to return forthwith to Ponlyne, and take leave for ever of Ponsee and its dangerous uncertainties.

The shots hurt nobody, and were traced to nobody. They were probably designed by Ponlyne himself to intimidate us, and aid his own pecuniary negotiation. The *ruse* was without effect. I promised to abide faithfully by my engagements, but by this time it was becoming apparent to all that we would never submit to wrongful extortion.

Three weeks more must be allowed to pass without record. I shall now state what took place on the 7th April, at a time when there seemed to be a chance of our release from Ponsee bondage :

—"This has been an eventful day—in promise big—in effect, an abortion. Tents struck, and baggage arranged for an early start. The chief and his Pawmynes appear by turns; but the porters only begin to assemble at 8 A.M. The chiefs are divided amongst themselves: both parties are intent only on 'loot,' and vie with each other for the lion's share. Either party seizes at the most promising packages, regardless altogether of their size or weight. My small japanned tin cases bring on a crisis. The chief's men have got them, and the Pawmyne, who heads the opposite party, is savagely drunk. The small circumference of our encampment is filled with armed Kachyens. The Pawmyne makes a dash at my gold sword, which is carried by a Burmese. Williams is standing near, and recovers it with a wrench which was irresistible. Pawmyne is at bay for a moment, but rushes away excitedly, and suddenly reappears, with his slow-match in a blaze. He is within three paces of me; but before I could move he has primed and fired his piece into the air, with a loud report. There is consternation for a moment, but no immediate movement. All would have been quiet again had not one of our party unfortunately fired off his revolver, with unmeaning effort. There is now tumult and confusion. The Kachyens fly in all directions, as if panic-stricken. The chief is quiet, and justly appreciates what is going on. He excuses his Pawmyne, calls back his people, and after a time order is restored. But we did not get off, and although our departure was fixed for the next morning, it was not until late in the day that the Pawmyne appeared, and said that, owing to the chief having withdrawn his support, they could not assist us further, and that we might make up our minds to stay for ever, as far as they were concerned, at our present halting-place, in the vicinity of Ponsee."

Another month passed in inactivity; and it was now evident that our stay in Kachyen-land had given rise to friendly attachments which the people clung to, as a means of continuing our detention rather than aiding our departure. Chiefs and people came in crowds from distant villages. Women and children were in the habit of daily visiting our camp with presents of rice, tobacco, vegetables, and beer, for which they obtained more than an equivalent in looking-glasses, beads, or other finery, which was immediately converted into a means of female decoration. The time spent in observing and conversing with these interesting groups was well repaid by the insight afforded into their domestic relations, and the opportunity it gave them of realising our friendly treatment, and the faithfulness of our intentions, as evinced by our close intercourse with them.

It was not until after the first week of May that the Panthay Governor of Momein had been able, as the result of our com-

munications with him, to drive the brigand chief Lee Sheetahee from his stronghold at Mauphoo, and despatch certain of the Shan chiefs, or their deputies, to us at Ponsee, with the means of a further advance from that place, through the Shan States to Momein.

On leaving Ponsee, a gradual descent of 4 miles brought us to the foot of the large spurs, which slope down in irregular projections, between the main ranges of the Taping Valley. We reach, in fact, the minor undulations which merge, so to speak, into the Valley of Sanda, and the eye roams over a comparatively narrow expanse of plain, stretching away in a north-easterly straight line into space, but bounded laterally by two lofty parallel ranges of mountains from 3000 to 7000 feet in height, with an average intervening area of 4 miles. This, in short, is the Valley of Sanda, which, with its prolongation to Nantin, contains the three Northern Shan States of Manwyne, Sanda, and Mynetee (Maungtee). Throughout it is richly cultivated, and presents an endless succession of villages, which either skirt the bases of the high land on either side, or nestle within clustering bamboos on the margin of the Taping. The Taping itself—no longer a mountain torrent—has now become a broad placid stream, with occasionally well-defined banks, and anon shelving reaches of shingle or sandbank, as it winds its mid-valley course through the plain.

Our arrival at Manwyne was a disappointment. The mule-men, with our baggage, on reaching the town, had thrown down their loads in reckless confusion on a portion of the dry bed of the river, at a great distance from habitation of any kind. Here we were immediately surrounded by hundreds of Shans and Chinese, who seemed unable to satiate their curiosity. The human or inhuman blockade was most effectually maintained. When at length the officials had cleared a road for us, and had been induced, after considerable entreaty, to provide us with quarters within a religious building adjoining the town, the curiosity nuisance had in no way abated. Neither priests nor officials had power to check it. There was absolutely no relief, —in eating, drinking, reading, writing, washing, dressing and undressing, it was in vain to attempt privacy. The glaring curiosity of these unsatisfied gazers was a positive affliction, forgotten happily for a time, though by no means terminated, even in sleep.

On the 13th May I visited the Dowager-Chief (called Saubwa-gadaw) of Manwyne. A very friendly conversation ensued, after which tea was handed round in true Chinese style. We seemed to have dropped from the Kachyen Hills, not into the Shan States only, but into veritable China, of which, in reality,

Manwyne forms a portion, for it is within the Province of Yunnan.

The Dowager-Chief's "haw," or palace, was situated within the town, and like all other haws, is built on the Chinese plan of a succession of quadrangular courtyards in a straight line, four or five deep, which lead into each other by a communication of arched doorways, with an exterior wall surrounding the whole. The inmost recesses are devoted to the family exclusively. The penultimate forms a reception-room for guests, the antepenultimate may be used as a caravanserai for strangers, stables, barracks, or accommodation for attendants.

The visit to the Dowager-Chief was an event which produced a decided improvement in our social relations with the Manwyne population. The return of civilities and mutual courtesy between ourselves and their chief, seemed to place us on a footing of familiarity, and the curiosity of our friends was more endurable, now that it was accompanied by evident signs of regard and friendship.

The 14th May was the day fixed for the march from Manwyne, and early on that day more than 3000 men, women, and children were present on the outskirts of the town to witness our departure. Our camp was crowded to excess with all the *élite* and fashion of a mixed Shan, Chinese, and Kachyen community. The population, generally, was well dressed, and the Shan women in particular were scrupulously neat and cleanly in their attire. Men wore loose jackets and trousers of dark blue cloth; but the women indulged in a variety of gaudy dress colouring. Their jackets were either white or pale green, slashed with pink at the sleeves and collars. The skirt was dark blue, with a variegated silk embroidery a foot in depth and worn as a flounce. Fanciful leggings and pointed slippers, with an innumerable array of silver ornaments, necklets, earrings, bracelets, and chatelaines, of various kinds, completed a costume novel in its way, but, on the whole, very rich, and singularly effective. We were escorted by several Shan officials, who led the way, mounted on ponies with huge red cloth saddles and padded coverlets, which raised them at least a foot above their animals' backs.

The whole day's march from Manwyne to Sanda disclosed fresh scenes of pleasurable interest. The monotonous grandeur of an apparently interminable valley, with its sublime ridges rising on either side of us 5000 feet, and running in straight parallels into space, was in itself a source of infinite admiration.

But to this estimate of its interest I must add that the whole valley area teemed with life, or with a population which had laid out every available acre into one vast garden of wealth and

fertility. Half-way between Manwyne and Sanda we passed through the Chinese town, or rather bazaar, of Karahokha, which consists merely of one broad street, flanked on either side by Chinese shops. On market days the whole intervening space is covered with a succession of bazaar stalls, in which butchers, bakers, druggists, and sundry Jacks-of-all-trades do a very thriving business. The gin shops or gin stalls probably do the largest trade of all. Five Chinese cash, or one-hundredth part of a rupee (about one-quarter of a farthing) is sufficient to purchase a small teacupful of a spirit which approaches in taste and potency to bad Scotch whisky. This is drunk freely, and probably, according to our ideas, to excess. But, somehow or other, no interruption is caused thereby to trade, and Shans and Kachyens thrive and are prosperous in spite of strong drinks and unlicensed distilleries.

After leaving Karahokha the route lay northerly, and brought us to the foot of one of the many spurs which abut into the valley from the counterslope of the western range. The soil is red, and the prolongation and connectionship of these spurs with the eastern range is often traceable at certain corresponding points, where the red soil crops up simultaneously on both sides in unmistakable relationship.

The town of Sanda lies at the foot of one of these red spur projections. It is the chief town of the Sanda Shan State, and contains, perhaps, 800 houses, with a population amounting to about 6000 souls. The houses at present represent ruins. The monasteries are mere bamboo erections, of temporary construction. There are neither temples, nor pagodas, nor minarets to proclaim the approach to a provincial capital. The remains of an old defensive loopholed brick wall may still be traced round a portion of the suburbs, but within its enclosure there is little save ruin and dilapidation. In 1863 Sanda was subjected to an irruption of Mahomedan Chinese. The town was first gutted by Panthay soldiery, and then handed over a prey to any number of Kachyen adherents, who professed at the time to favour the Panthay cause. Hence its present condition.

On 15th May, we paid our official visit to the Sanda Saubwa, or chief, at his palace. The approach to the palace is somewhat imposing, and consists of a triple archway, with one principal and two side entrances, the architecture throughout being essentially Chinese.

We passed through two courtyards, which communicated with each other through roofed archways, and were received in the vestibule of a penultimate building, furnished with high-backed chairs, a very high table, and Chinese paintings. The

open space in front of the vestibule was filled with respectable visitors, who had been invited to attend and note our interview with the Shan chief of Sanda.

The chief received us in a most friendly manner, but was at first exceedingly nervous, and apparently unable to address us in person. He subsequently warmed up as the conversation advanced, and we left him with a favourable impression of his intelligence, and a belief in the friendly regard he entertained in the success of our mission.

The next morning a deputation arrived from the chief with presents, and I was especially asked to adopt the chief's grandson, a young lad of eight, who was next heir to the Saubwaship.

The chief himself followed up this deputation by a return visit in person; and it is difficult to convey a correct impression of the earnest manner in which I was importuned to adopt the young grandson. I accepted the charge willingly. The chief was pleased, and the interview passed off with becoming cordiality.

Leaving Sanda, the road led through paddy-fields for two miles athwart the valley, where it crossed a spur, and once more resumed a north-easterly mid-valley course in the direction of Mynela (Muangla).

The River Taping is crossed at the ford of Nammon, which represents at this season a vast expanse of shingly desert, and is in reality the dry bed of the Taping and Takaw rivers, at the point of their apparent confluence.

The town of Mynela (Muangla) lies on the left bank of the Taping, at the base of a central spur, which seems to divide for a time the main valley longitudinally into two separate gorges, without causing any material deviation in the direction of the Sanda Valley itself, or the general parallelism of its high flanking ridges. As we approach Mynela (Muangla) from the west and south, the Taping is lost in an amphitheatre of hills which form a noble background to that ancient metropolis. It has entered the western of the two gorges into which the valley is here divided, and its source is traced to the village of Koo-yoon, 30 miles north, whilst the Takaw keeps to the eastern gorge and marks our route as far as Momein.

On entering the town of Mynela (Muangla), at 3 P.M. on 16th (May), we were conducted by the officials to a temple, which had been specially put into repair for our accommodation. It was a marvel as regards laborious structure and interior decoration, which seem to have been carried out with lavish expenditure, and represent brutes, heroes, and demigods, of extravagantly grotesque form and proportions.

Mynela (Muangla) is a larger, and, to all appearance, a more

important town than Sanda. It contains 1200 houses, which, like those of Sanda, are built of sun-dried brick, with no upper story. With the exception of a Chinese bazaar held in the centre of the town, no attempt has been made to lay out the place into roads or streets. The various roadways leading through the town are mere connecting lanes, flanked alternately by the backs of houses on the one side, and by walled enclosures with small covered gateways leading into petty courtyards, on the other. The general aspect of these Shan towns, as compared with the neat and cleanly appearance of the inhabitants, is disappointing, and is evidence of anything but thrift or wholesome domestic economy.

Each state is governed by an hereditary independent chief of its own, who is assisted by as many ministers as he may appoint, and by village *tamons*, or subordinate magistrates, selected by the several village communities.

A delay of a few days at Mynela became unavoidable, owing to the fact that the road in our advance was still reported to be infested with brigands, and the necessity therefore of our communicating with Momein before attempting the pass at Mauphoo.

Our communications in this respect were successful, and we were joined on the 21st by three Panthay officers with a strong military escort, which was to conduct us onwards from Mynela through Nantin to Momein.

We set out, accordingly, on the morning of the 23rd, and a march of two miles brought us to the left bank of the Takaw. Here we found our Panthay advance-guard halted. They said that a strong party of Dacoits were ahead, and intended to dispute the pass into the Mauphoo defile. The chief of Hotha, joined us at this contingency, and his information coincided with that of the Panthay advance-guard as to the almost certainty ahead of armed opposition. This announcement at the time was thoroughly embarrassing. To have turned our backs on an uncertainty, without any positive assurances of real danger, would have ruined our prestige and destroyed all hope of further progress. To have remained where we were would have argued weakness, and invited the very attack which I was anxious to avoid.

An advance was, therefore, inevitable; but it was not until our police escort had been drawn up in line and fired a very respectable volley (to try their muskets and reload) that the Panthay officers seemed disposed to move. They now exclaimed, "With fifty muskets like those, *which all go off* when required, we would march to Pekin even, in spite of all the opposition in the world." The march was resumed; but the Dacoits withdrew,—alarmed, no doubt, at the sound of our volley. They

left evidences, however, of their vicinity and of their cowardly revenge by cutting down and leaving in our pathway a poor traveller, who was gashed to death for the sake of a string of Chinese cash (value 2 rs.), of which, he had life enough left to tell us, he had just been dispossessed.

The valley had now narrowed very considerably, and as we approached its north-eastern extremity the only outlet consisted of a dark gorge or defile, through which the Takaw rushed with the roar and velocity of a mountain torrent. The sides of the gorge were precipitous rock, more or less scarped, which rose at intervals to a height of several hundred feet. No roadway was practicable through the gorge itself, and it therefore became necessary to ascend the western range parallel with the gorge, and proceed along it for seven or eight miles until a descent could be made into the Nantin Valley, which is, in reality, a continuation only or prolongation of the Sanda Valley.

The far-famed stronghold of Mauphoo is situated on this highland above the gorge; and, as we approached, the picturesque appearance of its natural scenery was considerably enlivened by the addition of a numerous array of gay banners, with which a Panthay garrison had embellished its battlements.

The march from Mauphoo to Nantin will ever associate itself in our minds by the gratifying marks of hospitality with which the Mahomedan Chinese (Panthays) welcomed us within the limits of their own possessions.

Strong guards had been stationed at appointed intervals along the route, and the nature of the ground was such as to enable them to be seen in the distance in all the gaiety with which full sunshine, variegated costumes, long silver lances, painted matchlocks, and large flags of multiform design and colouring, could possibly invest them. On our approach the guards severally beat gongs, fired muskets, waved flags, and otherwise, after their own fashion, evinced signs of greeting and salutation which would have done credit to the civilization and resources of any state in Asia.

The descent from Mauphoo brought us again to the bank of the Takaw River, at a point where it enters the gorge above-mentioned, and through which it has eaten for itself a way from the Nantin into the Sanda Valley.

The average width of the Nantin Valley did not exceed 3 miles, and its well-defined terraces, or gradations of terraces, at corresponding heights on either side, were evidences of a lacustrine period, during which a gradual outlet was being worked through the Mauphoo gorge. Here, too, we found the Takaw spanned by one of those veritable Chinese iron suspension-

bridges, the first of a series, which assured us that we had passed within the confines of the Celestial empire.

We reached Nantin the same day, as it was getting dark, and were conducted to the ruins of a Chinese temple, specially prepared for us. Shortly afterwards the Panthay Governor paid us a visit, accompanied by a nephew of the Governor of Momein and the Panthay "cazee," or magistrate, a man of unmistakable Mahomedan or Mussulman bearing, and with perfectly Mahomedan beard and raiment.

I returned the Governor's visit the next day. A salute was fired as we entered the palace, and the centre gates of the several archways were thrown open for our use, as a mark of special distinction, awarded only to chiefs of the highest rank.

There had been one slight hitch in our relations with the Governor, owing to my refusal to open out the contents of our packing-cases for the inspection of his customs officers. The matter was not pressed; but it caused unpleasantness until my interview with the Governor at his own palace. I then ascertained the real cause of the Governor's curiosity to learn the contents of our packing-cases. Amongst the many injurious reports which had preceded our arrival at Nantin, was one which invested us with supernatural powers of offensive action. Some of our boxes were said to contain magical weapons, which could of themselves subdue whole cities; others had concealed in them live dragons, which might be let loose, with terrible effect, against whole populations.

Absurd as these reports were, it was impossible to treat them with ridicule, or ignore the mischief they were calculated to do us, amongst a people more than ordinarily suspicious in their estimate of foreign intercourse. I was now convinced that the Governor's curiosity to inspect our boxes was genuine, and did not originate in a desire to be obtrusive.

The cases were open, I said, to inspection; but by this time the Governor had got over his doubts, and no further allusion was made to our caged dragons, or the boxed-up infernal machines which were to have worked ruin and extermination on all who opposed us.

One more march and we shall have reached Momein.

On leaving Nantin the configuration of the valley had somewhat changed, and the eastern main range no longer continued to be a single continuous range, such as that which characterized its direction along the line of the Sanda Valley. There now appeared to be a ramification of irregular spurs, all tending in a northerly direction, and yet so closely allied to each other as to form a connected series of undulations; or, in other words, a

broad expanse of uneven table-land, at some elevation above the circumadjacent valleys.

The ascent to this table-land is commenced half-way between Nantin and Momein; and, as soon as the highland is reached, it slopes away again in a gradual series of descents as far as Momein, which is itself situated within the fork of two valleys: that on the west being a sinuous prolongation of the Nantin Valley on the one side; whilst that on the east is another small valley, between the Momein mid-valley ridges above-mentioned and the main eastern range (Deebay), which has again entered an appearance, and is here the chief watershed between the Tahaw and Shwélee affluents of the Irrawaddy.

The approach to Momein is very grand and beautiful. We had been descending for some time the eastern side of the central ridges already described, and the road, after passing down a series of grassy undulations, led round the south of a tumulus-shaped hill, 1000 feet in height, crowned on its summit by a Chinese tower-pagoda. At this point Momein itself and its battlemented walls are suddenly brought into view, in a hollow basin, enclosed on all sides by hills, which slope down, apparently at different elevations, almost to its very walls.

But the most effective scene of the whole, as it then appeared to us (with senses by this time somewhat deadened to the attractions of mountain scenery), was that which presented itself in the foreground, half-way between our position at the foot of Pagoda Hill and the southern face of the city wall.

The Governor had thought fit to come out in full state to welcome us to his capital, and his guards and retinue formed a temporary encampment, which was intended to display at once the wealth and resources of the Mahomedan Chinese Government. The encampment was marked out by a long line of flags in infinite variety of shape and colouring. On coming near them, I halted to make preparations for meeting so formidable an array of our expectant friends. We were a very rough and dirty-looking group of foreign adventurers. A march of 23 miles over dusty hills and across muddy ravines had not added to personal appearances, or to that dignity of demeanour which might anxiously be looked for in the pioneers of trade and the representatives of Western civilization. As we drew near, guns were fired, gongs beaten, and bands played. Standard bearers —some two hundred in number—lined both sides of the road through which we were to advance, and in front of them were ranged Panthay officers of all grades and in full uniform. Our appearance, as we filed through this martial gathering, must have been as novel to the Panthays, by reason of its unaffected

simplicity, as their display seemed out of order to us, on account of its extent and comparative magnificence.

The reception was undoubtedly flattering and courteous to excess, and, as such, produced feelings of gratification in those who had come almost as strangers to an unknown and unrecognised Government, and who, after several months of obstruction and annoyance, suddenly found themselves amongst powerful friends and raised to the position of well-favoured guests.

But we are now at Momein, and, so far as progress is concerned, our journey has come to an end. We were guests of the Panthay Government for a period of seven weeks. Much of interest remains to be told of our return journey to Bhamo, through another beautiful Shan valley, and across two more unexplored routes over the Kachyen mountains.

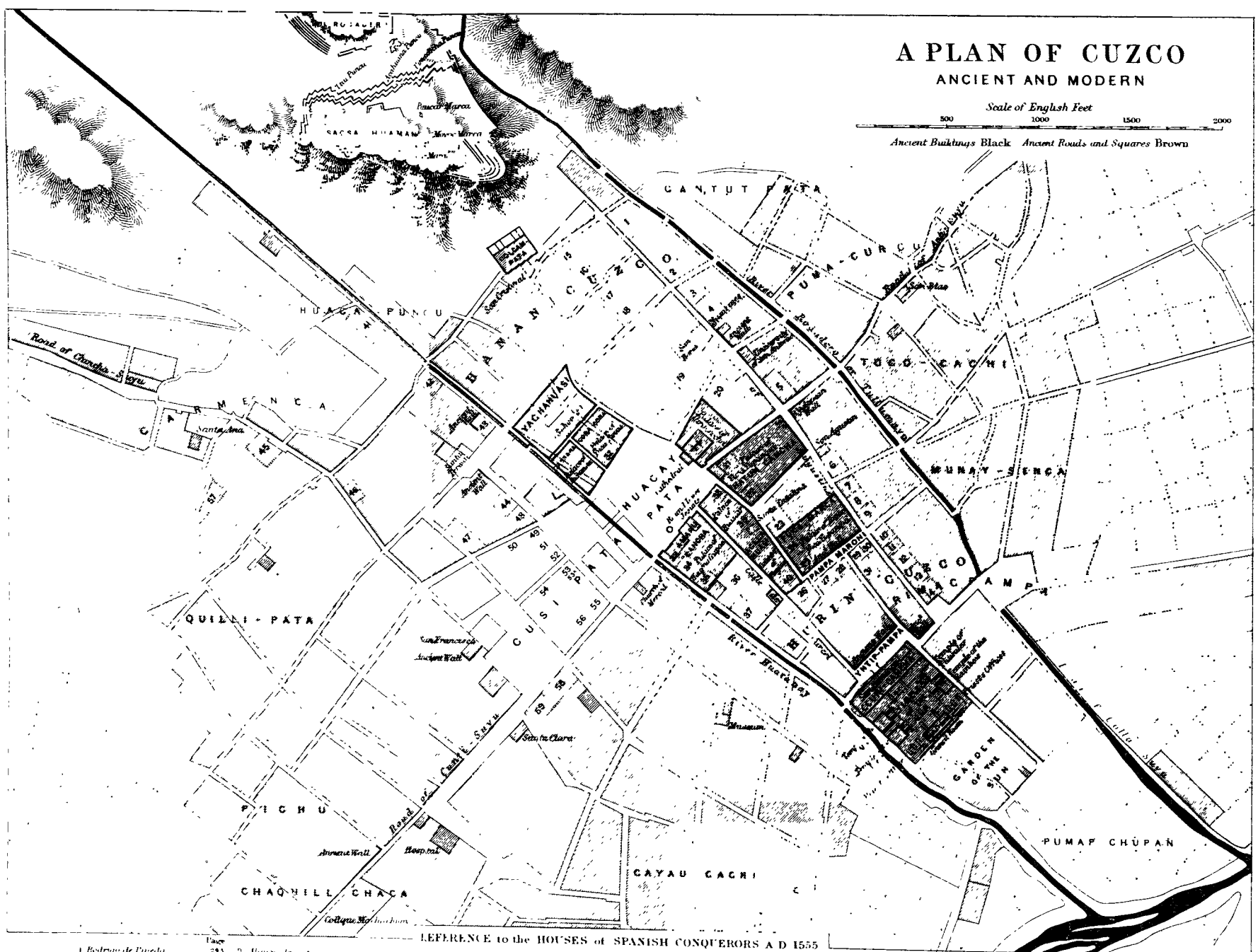
We reached Mandalay, on our return, on the 20th September, after an absence of more than nine months, during which, there and back, our journey had not extended over a distance of perhaps more than 1000 miles. This of itself, perhaps, affords proof that the hitherto forbidden tract which separates Burma from China was not explored without trials and difficulties of no common or ordinary nature.

It is satisfactory, however, to know that all those difficulties were traced to one source, and arose out of the indirect action of *one* powerful native Government. Had this action been favourable, or had this native Government simply acted up to its professions and promises, the expedition would have performed its work in fewer weeks than, under existing circumstances, it took months for successful accomplishment.

If the route between Bhamo and Momein is not now open, other causes must be taken into account as being in opposition, without detracting in any way from the merit due to the successful accomplishment of all the duties with which the expedition was entrusted.

The expedition itself reached a point in China as far as, and beyond that to which the discretionary powers with which it was invested permitted. Agreements to facilitate trade were made with every person or chief who had any semblance of authority in the region the expedition traversed. The Panthay rulers came under a formal engagement, and the Kachyen Hill-chiefs bound themselves by a solemn oath, sworn to after their own savage ceremonial, to protect and afford safe-conduct to traders and travellers who might have occasion to cross the hill ranges between Bhamo and the Northern Shan States.

My firm conviction is that, despite all obstacles and all retarding influences of whatever nature, the prospective results


A PLAN OF CUZCO
ANCIENT AND MODERN
Scale of English Feet
500 1000 1500 2000
Ancient Buildings Black Ancient Roads and Squares Brown
CANTUT PATA
PUMA-CURCU
HUACA PUNCU
HANAN CUSCO
HURIN CUSCO
TOCO-CACHI
MUNAY-SENCA
CARMENCA
HUACAY PATA
QUILLI-PATA
CUSI PATA
PICHU
CHAQUILL CHACA
CAYAU CACHI
PUMAP CHUPAN
YACHAHUASI
PAMPA MARON
KIIP-PAMPA
GARDEN OF THE SUN
Rond. or Chaupichaca
Santa Clara
Hospital
Museum
River Huatanay
REFERENCE to the HOUSES of SPANISH CONQUERORS A D 1555
1 Rodrigo de Paredes
2 Juan de Saavedra
3 Diego Ortiz de Guzman
4 Pedro de los Rios
5 Hieronimo Castilla
6 Gaspar de
7 Martin
8 Juan
9 Alonso de
10 Gabriel Cornejo
11 Pedro de Torralba
12 Antonio de
13
14 Pedro de Barco
15 Alonso Palomino
16
17 Pedro Puertocarrero
18 Francisco Hernandez Giron
19 Antonio Altamirano
20 Francisco de Cuevas
21 Sebastian de Castilla
22 Pedro Ortiz de Orue
23 Juan de Pancorvo
24 Hernando Pizarro
25 Marcos Serra de Leguisamo
26 Alonso de Loaysa
27 Martin de Meneses
28 Juan de Figueroa
29 Pedro Puertocarrero
30 Gaspar de Melo
31 Francisco Delgado
32 Juan de Pancorvo
33 Hernando Pizarro
34 Marcos Serra de Leguisamo
35 Antonio Altamirano
36 Prison
37 Alonso Maldonado
38 Francisco Mena
39 Pedro del Barco
40 Escribano de la Hacienda
41 Pedro Ortiz de Orue
42 Juan de Pancorvo
43 Hernan Bravo de La
44 Alonso de Benavente
45 Diego de Silva
46 Pedro Lopez de Carvalla
47 Juan de Betanzos
48 Alonso de Mesa
49 Garcilasso de la Vega *
50 The Princess Beatriz
51 Antonio de Quiñones
52 Tomas Vasquez
53 Alonso de Toro
54 Rodrigo de Esquivel
55 Antonio Pereira
56 Pedro Alonzo Carrasco
57 Francisco de Villafuerte
58 Gomez de Tordoya
59 Martin de Arbieto
According to Squier 53

of our expedition will reveal themselves in time by a vast increase to the trade of this country, by free commercial overland intercourse between Burma and China, and by a tardy but cordial recognition of our services by the country at large.

XI.—*On the Geographical Positions of the Tribes which formed the Empire of the Yncas, with an Appendix on the name "Aymara."* By CLEMENTS R. MARKHAM, C.B., Secretary R.G.S.

Read 10th July, 1871.

THE study of the nature and degree of the civilization attained by the aboriginal Americans is especially important, because that civilization was self-developed. The three American empires of the Yncas, the Chibchas, and the Aztecs, were based upon the progress made in the arts of civilization by the tribes which composed them, and on the united efforts of those tribes, after they had been welded into great nations. But the tendency of the united empires was to obliterate all the special characteristics of the component tribes, and to make it a task of extreme difficulty to classify or distinguish them. This difficulty is increased by the want of system in the early writings, from which alone we can now hope to derive our information. Yet it is only by resolving the American civilizations into their elements; by extracting from all reliable sources the names, localities, and characteristics of the component tribes; and by classifying them with as near an approach to accuracy as is now possible, that the inquirer can obtain a knowledge of the early history of the American races, or any idea of their origin. Without such classification there is no sure foundation on which he can base any conclusion, and little to which he can apply his science for any useful purpose.

In the present paper I propose to submit an attempt at the geographical classification of the tribes which eventually combined to form the empire of the Yncas; and I hope, on a future occasion, to work out a similar arrangement as regards the tribes in the region of Chibcha civilization.

But it is above all things essential to sift the authorities upon whom it is necessary to rely, to ascertain with great care the amount of credibility that should be allowed to each, and to attend strictly and closely to the conclusions derived from such considerations.

I now proceed to state the canons of criticism by which I

have been guided in the present investigation, and upon which my conclusions are based.

My first rule is to assume no fact respecting the names of tribes, their localities, and circumstances at the time of the conquest, unless it is stated by a writer who was actually in the country during that event, or so soon after as to have been contemporaneous with the conquerors. I include such authorities in my first class, and they are as follows:—

1. *Polo de Ondegardo*, a learned and discerning lawyer and statesman, whose writings are thoroughly reliable. Unfortunately they are still in manuscript, and only a portion of them is in my hands (1550).

2. *Cieza de Leon* is the authority second in importance. He was a generous, liberal-minded man, and his work bears evidence of impartiality, accuracy, and intelligence (1554).

3. *Agustin de Zarate* is an authority who had excellent opportunities of observation, but he was very dense about understanding native names and phrases; and inferior to the two authorities I have placed before him, in exactness, in power of observation, and in the value of the material he collected (1555).

4. *Fernandez de Palencia* is an authority of equal weight with Zarate, but inferior to the others (1571).

5. *Cristoval de Molina*, the priest of the hospital at Cuzco. His account of the rites and ceremonies of the Yncas, with their prayers and hymns, is still in manuscript at Madrid (1580).

6. *Miguel Balboa*, a good authority, who was in the country from 1566 to 1586; chiefly in the Quitu region.

7. *Father Blas Valera*, a scholar, a linguist, and a close observer. Only fragments of his work have been preserved by the Ynca Garcilasso, but they are of great value (1590).

8. *Father José de Acosta*, a Jesuit, whose 'Natural History of the Indies' contains many curious details. But he was ignorant of the language, credulous, and prejudiced. He tells us that he quotes much from Polo de Ondegardo, and if, like the Ynca Garcilasso, he had given references to his authority, it would be possible to pick out the passages of his work that are reliable.* But he does not (1590).

9. *Garcilasso, Ynca de la Vega.* Although the great Ynca historian lived during the generation after the conquest, I place him in the first class, because his Indian descent, and correct knowledge of the language, gave him advantages and opportunities which no other writer possessed. He, alone,

* His list of names of stars in the Ynca language is copied, without acknowledgment, from Balboa.

among the early authorities, quotes each author from whom he derives information, and carefully compares their statements. As regards the amount and interest of the details collected by him, the Ynca is worth much more than all the other authorities put together (1609).

My second rule is to accept no statement respecting the name, locality, or early history of any tribe, made by any author writing in the two centuries after that in which the conquest took place, unless it is corroborated by one or more of the authorities of the first class. The Ynca Garcilasso, for reasons already stated, is the single exception. Statements respecting the manners and customs of tribes, made by later writers, are worthy of attention, and of being considered on their merits. The antiquity of many of these customs may be safely assumed, especially those of a religious or superstitious character. The writers of the second class are:—

1. *Bishop Luis Geronimo de Orè*, a native of Guamanga, in his 'Manuale Peruanum,' is the only source from which we get specimens of the *Puquina* and *Mochica* languages (Naples, 1602).

2. *D'Avalos y Figueroa*, a native of La Paz, whose knowledge of the languages is the cause of his having interspersed some pedantic essays on love, and other miscellaneous subjects, with scraps of valuable information (Lima, 1602).

3. *Torres Rubio*, a Jesuit, and author of grammars and vocabularies in the languages of the Yncas (Quichua) and of the Collas (Aymara) (1st ed. 1603).

4. *Juan de Figueredo*, author of a vocabulary and notes on the Chincha-suyu language. (In Torres Rubio.)

5. *Francisco de Toledo*, a statesman of untiring zeal and energy, and great capacity for work, whose 'Ordenanzas' contain a multitude of curious stray bits of information (1590).

6. *Gonzalez Holguin*, a Jesuit linguist, who was Interpreter-General to Toledo. He wrote a grammar and dictionary of the language of the Yncas (1607).

7. *Francisco de Avila.* A priest, who wrote an interesting account of the superstitious rites of the Indians of Huarochiri (1601). It is still in manuscript at Madrid.

8. *Ludovico Bertonio*, an Italian Jesuit, who wrote a grammar and a copious dictionary of the corrupt language spoken at Juli, near the western shore of Lake Titicaca, by a mixture of many tribes, collected there from all parts of the Ynca empire. He calls this language *Aymara* (1612).

9. *Alonzo de Ramos*, a miracle-monger, and author of the history of Copacabana, in which he has given some valuable information respecting the tribes round Lake Titicaca (1620).

10. *Pablo Arriaga,* a bigoted iconoclast, and guilty of many barbarisms, but his work on the extirpation of idolatry is quite invaluable (1621).

11. *Memorias de los Vireyes,* The Minutes by the Viceroys, Prince of Esquilache (1620), and Count of Castellar (1681), contain accounts of the wild Urus Indians.

12. *Fray Bernardino de Cardenas,* a native of La Paz, wrote the 'Manuel y Relacion de las cosas del Reyno del Peru,' which is useful (Madrid, 1634).

13. *Fray Diego de Cordova y Salinas,* a native of Lima, and Chronicler of the Franciscan Friars, gives a useful account of their Missions (Madrid, 1643).

14. *Fernando de la Carrera,* a native of Truxillo, published the only grammar of the Indians of the Peruvian coast (Yunca). (Lima, 1644.)

15. *Fernando Montesinos.* "Fernan Mendez Pinto was but a type of thee, thou liar of the first magnitude"! (1652.)

16. *Calancha,* the Chronicler of the Austin Friars, whose work is a precious storehouse of details respecting the manners and customs of the Indians (1653).

17. *Juan de Padilla,* the author of an interesting and valuable letter on the condition and treatment of the Indians (1657).

18. *Fray Bernardo de Torres,* a Lima professor, who wrote a second Chronicle of the doings of the Austin Friars in Peru, which is inferior to that of Calancha (Lima, 1657).

19. *Antonio de Leon Pinelo,* a lawyer, whose report to the Viceroy corroborates and adds to the information given by Arriaga and Padilla (Lima, 1660).

20. *Gaspar de Escalona,* a native of Chuquisaca, in his 'Gazofilacio Real,' has collected many details of value (Madrid, 1647).

21. *Francisco de Montalvo* wrote a life of St. Toribio, the holy Archbishop of Lima, which contains several interesting details respecting the Indians (Rome, 1683).

22. *Juan de Santa Cruz Pachacuti.* An account of the antiquities of Peru by an Indian; still in manuscript at Madrid (1690).

23. *Pedro Peralta,* in his description of Peru and history of the origin of the Yncas, is sometimes useful in suggesting further search on certain points (Lima, 1723).

24. *Mercurio Peruano,* a Lima periodical, which contains valuable accounts of the Canas and Canches Indians, and those of Truxillo, Tarma, &c. (Lima, 1790–96).

25. *Juan Jorge* and *Antonio Ulloa,* in their travels and 'Noticias Secretas,' give much information respecting the Indians of Quito.

26. *Juan de Velasco*, a laborious scholar, and a patriotic defender of the South American races against the attacks of Robertson and Pauw. His history of Quito is most valuable (Quito, 1789).

27. *Lorenzo Hervas.* The great learning and acute criticism of the Abbot, and his valuable remarks on the languages and dialects of the Ynca empire, place him in the first rank of second-class authorities (1800).

My third rule is to discard those early writers who were never in the country, such as *Herrera*, *Gomara*, and *Levinus Apollonius*, unless they give their authorities.

My fourth rule is, while fully recognizing the great value and importance of the writings of modern travellers and students—especially those of *Rivero*, *von Tschudi*, *D'Orbigny*, *Lorente*, *Mossi*, *Paz Soldan*, *Barranca*, *Squier*, *Wilson*, *Forbes*, and *Bollaert*—and availing myself of many of their references and suggestions; never to rely upon them for any statement not based on personal observation.

My fifth rule is to look upon traditions of modern Indians, and statements of living persons respecting historical events, when unsupported by contemporary authority, as absolutely worthless.

Thus, to sum up the critical rules by which these investigations have been guided, the names and localities of tribes are derived from authorities in the first class; some additional details on the above points are gathered from those of the second class, when they are corroborated, in the main, by the earlier and only reliable authors; accounts of manners, customs, and languages are accepted from the second-class writers so long as they are not contradictory; while the statements of early writers who were never in the country, unless they quote their authorities, and modern so-called traditions, are absolutely rejected. A personal knowledge of the localities is necessary for the identification of places mentioned by all the authorities, as well as an acquaintance with the languages, people, and their architectural remains. It would be useless to attempt a critical investigation of this subject without such special knowledge. The extent to which my personal acquaintance with the country reaches will be seen by the map. As regards the regions to the north and south of the portion explored by myself, I am obliged to rely upon the information of other travellers.

The region inhabited by the nations which formed the empire of the Yncas is a long strip of mountain and coast line, bounded on the east by the forest-covered plains of the Amazonian basin, on the west by the Pacific Ocean, and extending north and south from 2° N. to about 20° S., or upwards of 1500 miles, with an

average width, between the sea-shore and the Amazonian forests, of 400 miles.

This vast tract comprises every variety of climate, and contains within its limits most prolific tropical forests, valleys with the climate of Italy, a coast region resembling Sind or Egypt, temperate hill-sides and plateaux, bleak and chilling pasture lands, and lofty peaks and ridges within the limits of eternal snow. On one mountain side the eye may embrace, at a single glance, sugar cane and bananas under cultivation in the lowest zone, waving fields of maize a little higher up, shaded by tall trees, orchards of tropical fruits, stretches of wheat and barley, steep slopes clothed with potatoes and quinua, bleak pastures where llamas and alpacas are browsing, and rocky pinnacles streaked with snow. In such a country, with such a variety of climates and products, and where communication is so difficult, the various nations appear to have gradually developed their capabilities in almost complete isolation, and much influenced by the circumstances which surrounded them, during a course of ages. I will endeavour to sketch the main features of the region, and to indicate its natural divisions, while submitting my classification of the nations, and my view of the positions inhabited by each, as given by the earliest writers on the subject.

The tribal divisions of the empire of the Yncas agree well with its leading physical aspects. They consist of five clearly defined regions; four following the lines of the Cordilleras, and the fifth on the sea coast. The first and most northern extends from the River Ancas-mayu to the knot of Loxa, a distance of 350 miles, and is included in the kingdom of Quitu. The second reaches from the mountain mass of Loxa to the saddle which separates the drainage of the Huallaga and Ucayali. It is 450 miles long, and comprises the Ynca division of Chincha-suyu. The third and most important region is that which is drained by affluents of the Ucayali. It includes the home of the imperial tribe, and I shall, therefore, call it the Ynca division. The fourth comprises the basin of Lake Titicaca, and is known as the Collao. The fifth is the coast region, and extends along the shores of the Pacific from the bay of Guayaquil to the desert of Atacama, a distance of 1200 miles. The principal tribes of the coast were called Yuncas by the earliest writers and by the Yncas, and I shall, therefore, adopt this name for the division. I have enumerated the mountain regions as they follow each other from north to south, but I propose to treat of them in the order of their importance, as follows:—I. The Ynca region; II. The Collao region; III. The Chincha-suyu region; IV. The Quitu region; and V. The Yunca region.

I. The Ynca Region.

The Ynca region extends from the water-parting between the basins of the Huallaga and Ucayali, at Cerro Pasco, to that between the basins of the Ucayali and Lake Titicaca, at the base of the famous peak of Vilcañota, a distance of 380 miles. It is enclosed between the ridges of the maritime Cordillera and the eastern Andes, and is entirely drained by the affluents of the Ucayali, except at one point where it extends some distance over the coast watershed. In this mountain region every variety of climate is met with. Here nature has worked on her grandest and most imposing scale. The scenery is glorious, the products of every zone are collected upon one mountain side; but the difficulties in the way of advancing civilization, caused by the mighty obstacles of nature, are such as to tax man's ingenuity to the utmost. Humboldt has well observed that "when enterprising races inhabit a land where the form of the ground presents to them difficulties on a grand scale which they may conquer and overcome, the contest with nature becomes a means of increasing their strength and power as well as their courage."* A country like this was well adapted for the cradle of an imperial race. Its natural divisions are marked by the rivers that either flowed through or formed the boundaries of the six aboriginal nations of the Ynca region, which were as follows:—

1. *The Yncas*, whose original seat was the country between the rivers Apurimac and Paucartampu, with the lovely valley of the Vilcamayu bisecting it.
2. *The Canas*, between the summit of the Vilcañota pass and the point to which the Yncas originally extended, in the valley of Vilcamayu, with the mountains on either side.
3. *The Quichuas*, whose country originally extended from the Apurimac to the Pampas, but who were latterly confined to the valleys and mountains to the south, amongst which flow the head-waters of the Apurimac and Amancay, and their affluents.
4. *The Chancas*, a nation extending from the neighbourhood of Huanta to the Pampas, and latterly, after driving the Quichuas higher up the valleys, to the Apurimac.
5. *The Huancas*, occupying the valley of Sausa, and the shores of Lake Pumpu, up to the ridge of Cerro Pasco.
6. *The Rucanas*, on the lofty summits of the maritime Cordillera, and part of the coast watershed.

1.—The Yncas.

The above six nations were closely allied, and seem to have had a common origin. Inhabiting regions alike in all respects,

* 'Aspects,' ii. p. 274.

their development depended on the same causes, and they had to encounter the same difficulties in their first advances towards civilization. In the prehistoric times there were doubtless many struggles for supremacy and leadership, until finally the Ynca nation achieved undisputed sway. The original boundaries of the Ynca country are given by the historian Garcilasso, and as the limits of territory occupied by each *Ayllu*, or lineage, were carefully recorded, these boundaries may safely be assumed to have been accurately defined.

The Ynca country was bounded on the west by the precipitous gorge of the Apurimac, and on the east by the Paucartampu river. North and south it extended along the valley of Vilcamayu, which passed through its centre, from Quequesana to the fortress of Tampu. It thus consisted of a rich and fertile central valley, enjoying an Italian climate, and yielding corn and fruit in abundance, and a mountainous tract on either side with pastures and rugged heights. Cuzco is on the western highland, between the central valley and the Apurimac. The district is about 70 miles by 60 miles in extent.

The proper name for the aboriginal people of this tract is Ynca. All the chiefs, or rather heads of *Ayllus*, or lineages, were called Yncas, and it was not until later times that the name was assumed as the special title of the royal family. Even then the head men of this original cradle of the imperial race retained the name of Yncas, but it was pretended that the title had been conferred upon them as a great favour.* It is improbable in the extreme that a royal family should confer their own peculiar name upon all the head men of the villages under their sway; and the probable alternative is, that Ynca was the original name of the nation, afterwards adopted as an imperial title when the national chief became sovereign over many other nations. The names of the *Ayllus*, or tribes of the Ynca nation, were as follows:—

WEST. (Towards the Apurimac.)	CENTRAL. (Basin of the Vilcamayu.)	EAST. (Towards the Paucartampu.)
Chinchapucyus.	Hanan-Cuzcos.	Poques.
Rimac-tampus.	Hurin-Cuzcos.	Mayus.
Papris.	Yucays.	Cancus.
Mascas.	Ayamarcas.	
Chillquis.	Quespicanchis.	
	Muynas.	
	Quehuars.	
	Huarucos.	
	Urcos.	

* G. de la Vega, I. lib. i. cap. 22.

There is no evidence for the belief that the Yncas originally came from a distance. The popular tradition was, that they first appeared from a cave at Paccari-tampu, nearly in the centre of the home district; or, in other words, that, so far as tradition could pierce into the past, their civilization was altogether of indigenous origin and growth. A very prevalent theory, however, derives the Yncas from the banks of Lake Titicaca, and upon this inverted pyramid many other equally baseless theories have been piled. It is therefore necessary to clear the ground by stating, in as few words as possible, the reasons for believing the Yncas to have been aboriginal inhabitants of the country round Cuzco, and the evidence upon which their supposed Titicaca origin rests. All the early writers on the subject, who made enquiries from the Indians at the time of the conquest, or in the succeeding generation, with a single exception, that of Zarate,* were told the same tradition, though some recorded other traditions as well. That tradition pointed to the *native* origin of the Yncas, and showed that the people had no idea of the first Ynca having come from a distance. Polo de Ondegardo,† Fernandez,‡ Balboa,§ Garcilasso de la Vega,‖ Acosta,¶ Montesinos,** D'Avalos y Figueroa,†† and Molina,‡‡ have all preserved the same tradition, and their accounts of it differ sufficiently to show that they were derived from sources independent of each other. Zarate, Balboa, Molina, and Acosta §§ were also told that the Yncas came from the lake of Titicaca, and a similar story was recounted to Garcilasso by an old Ynca prince, who was his uncle.‖‖ This prince, who told other wonderful stories to his nephew, was a grandson of that Ynca Tupac Yupanqui who built many edifices on the islands of the lake, who was fascinated by the bright expanse of waters, and who made the shores of the inland sea his favourite residence. Garcilasso himself, who tells both the popular traditions and the story of his uncle, looks upon all as equally unworthy of belief,¶¶ and conjectures that a fiction, in some form or other, was invented by the early sovereigns to establish their authority.***

The origin of the Titicaca fiction may be gathered from

* 'Hist. del Peru,' lib. i. cap. 10.
† MS. 'Del linage de los Ingas y como conquistaron.'
‡ 'Hist. del Peru,' Part II. lib. iii. cap. 5.
§ 'Hist. del Peru' (T. Campans' ed.), vol. vi. p. 18.
‖ 'Comm. Real.' I. lib. i. cap. 18.
¶ 'Hist. Nat. de Indias,' lib. vi. cap. 20.
** 'Mem. Hist.' (T. Campans' ed.), vol. viii. p. 3.
†† 'Miscelanea Austral. Coll.,' xxii. p. 141.
‡‡ MS. Penes, C. R. M. §§ 'Hist. Nat. de Indias,' lib. i. cap. 25.
‖‖ 'Comm. Real.,' I. lib. i. cap. 16.
¶¶ My translation, vol. i. pp. 61 and 71. *** Ibid. p. 93.

Molina's narrative. He thus relates the belief of the Ynca priests. The Creator, he tells us, dwelt at Tiahuanacu, and hence the superb edifices at that place. It was dark, and there he created the sun and moon, ordering them to go to the isle of Titicaca, and thence to ascend to their places in the heavens. He also created the first Ynca. As the sun rose, it called to the Ynca and told him to be lord of the land. At the same instant the Creator caused the first Ynca and his wife to descend under the earth, and they came out again in the cave of Paccari-tampu. The ancestors of all the other tribes of the empire were also created at Tiahuanacu, and, descending under the earth, came out in their respective countries, from caves or fountains or stones, which were ever afterwards worshipped as *huacas*.

There are priestly myths regarding the sun-worship. On their festivals, the Yncas went out towards the rising sun. In three months of the year the sun rises exactly over the end of the road leading from Cuzco towards the Collao, and when the Ynca territory only extended to Quequesana, it was at Paccari-tampu, close by, and the nearest point to the sun rising, that the Yncas fixed the origin of their ancestor, the child of the sun. After the Ynca conquests had extended to the Collao, the priests saw the sun rising out of the great lake of Titicaca; so when the Yncas began to employ the conquered people in erecting the vast edifices at Tiahuanacu, they selected that spot for the mythic place of origin of their deity. But the memory of the building of these ruins faded away, and then they were attributed to the Creator himself. Centuries afterwards the Ynca Tupac Yupanqui built temples on the island of Titicaca, and, to increase their sanctity, the sun had to be brought there from Tiahuanacu, before ascending to the heavens. The main point to be observed in all this, is that the Paccari-tampu origin was the more ancient tradition generally received by the people. When, therefore, the priests, in following the sun-rising, came to Titicaca and adopted the new Tiahuanacu myth, they seem to have felt the necessity of connecting it with the older and more popular story. So Manco Ccapac is located at Tiahuanacu, and made to go under the earth, come up at Paccari-tampu, and there have a second origin. This shows that the Paccari-tampu origin was the earliest belief, that the Titicaca origin was a more modern idea, conceived after the conquest of the Collao, and engrafted on the popular notion; but that both were myths referring to sun-worship, and relating to no real facts.

Having disposed of these fables, we come to the consideration of a people which had been established from prehistoric times in the districts round Cuzco, and had gradually developed an indigenous power and civilization, until they commenced a

career of conquest, and their dominions assumed imperial proportions. It is not the object of the present paper to discuss the various interesting points relating to Ynca civilization, excepting so far as some of them will assist us to eliminate Ynca elements in the history of other nations, and so to attain correct notions of their original condition. With that end, however, it will be necessary to consider briefly the nature of the religious belief, of some of the customs, and of the language of the Yncas, and especially to bear in mind the character of their architecture, and the progressive stages of their advance in the art of building.

The leading feature in the popular religion of the Yncas was the belief that all things in nature had an ideal, or soul, which ruled and guided them, and to which men might pray for help. Acosta compared this doctrine to the ideas or essences of Plato. It was the popular creed of the Ynca people, to which they tenaciously clung long after the Spanish conquest, and it is not now wholly rooted out. The gorgeous and imposing sun-worship of their rulers, and even the belief of the learned among them in a creator called Pacha-camac, was but a development of the religion of the people. All visible emblems or signs of these ideals or souls were called *huaca*, and they were represented in a thousand ways, which varied among the different nations, so that we may classify the tribes, to some extent, by a reference to their *huacas*. Those of the Yncas were chiefly in the form of vases moulded into the shape of the object to be idealized, such as llamas, fish, maize, fruit, &c. The Yncas also worshipped their ancestors, the *Pacarina*, or forefather of the *Ayllu*, or lineage, being idealized as the soul or essence of his descendants.* The emblem to be worshipped was the actual body, called *malqui*, which was preserved with the greatest care in caves called *machay*, and on solemn festivals each *Ayllu* assembled with its *malqui*. In the ravines running off from the valley of Vilcamayu, the cliffs are literally honeycombed by the *machays*, or masonry cells, built against the rocks. This is especially the case on the huge cliff overhanging Urubamba, called *Tantanamarca*, or "the crowded height;" and in a gorge near Pisac, known as the *Huaccan-huayccu*, or "ravine of mourning." It is impossible that we should ever succeed in perfectly understanding the modes of thought which were developed into these forms of worship, especially as the information is conveyed to us through the medium of bigoted Spaniards, who were little likely to appreciate or understand the feelings of the conquered people;

* *Paccarina* is the participle of the verb *paccarini*, "to dawn," or "to be born"; from *paccari*, "morning." Hence the word was applied to the originator, the birth-giver of a family.

but the forms themselves are valuable guides to the classification of the various nations.

The language of the Yncas, which was originally spoken by three at least out of the six other nations in the Ynca region, is also a most important element in the attempt to classify the component parts of the Ynca empire. This general language, as it was called, was introduced into every conquered province, and carefully taught to the people. It was improved and polished and enriched as the civilization of those who spoke it advanced; and, in the form it had assumed, when the Ollanta drama and the ancient prayers given by Molina were composed, it was capable of expressing abstract ideas and sentiments, while it retained great purity. We can separate indigenous from Ynca words when dealing with the fragments that have been preserved of the dialects of other tribes, and we can thus ascertain to what extent each nation originally differed from the Yncas, as regards language. When the difference is only found in the terminations and particles, or in the vocabularies, it merely establishes a dialect. But when the grammatical construction is quite dissimilar, as well as the vocabulary, we have a distinct language, and a consequent marked separation as regards race.

Garcilasso de la Vega tells us that the Ynca royal family had a special court idiom, but his statement is unsupported by any other authority. He says, however, that this idiom was entirely lost at the time he wrote.* This is insufficient evidence on which to base a theory that the Ynca royal family spoke a language differing entirely from that of the people; and I agree with Hervas † that such was not the case. It is likely enough, as Hervas suggests, that the royal family and the courtiers, among themselves, used many words in a sense which was not their ordinary meaning, and even had special words of their own. But there is no evidence for the belief that the court dialect of the Yncas, mentioned by Garcilasso, was anything more than an artificially invented means of intimate communion.

Garcilasso mentions eleven words, one of which he says belonged to the court language, and he gives its meaning, while he only conjectures that the other ten may have belonged to it, because he did not know their signification. The believers in an "ancient Aymara civilization" have carried their theory so far as to suppose that their so-called "Aymara" language was the same as the court language of the Yncas. We have only the above eleven words to judge from, but they tell us

* I. lib. i. cap. 24; I. lib. vii. cap. 1. † i. p. 240.

enough to upset this conjecture. Most of them are ordinary Quichua words.

1. *Cuzco.**—Garcilasso says that this word belonged to the court dialect, and signified a *navel.* The word for a navel in the so-called "Aymara" language is *cururu;* and the word *cuzco* does not occur in any of the dictionaries.

2. *Ayar.*†—Garcilasso merely guesses that this word may have belonged to the court dialect, because he did not know its meaning. It is not in any of the "Aymara" dictionaries.

3. *Manco.*‡—Garcilasso says the same of this word as of *ayar.* It also is not in any of the "Aymara" dictionaries.

4. *Collcam.*§—Garcilasso says he did not know the meaning of this word, so conjectures it may have belonged to the court dialect. In reality it means an underground granary in the general language of Peru.‖ It is met with in "Aymara," but that it was not borrowed from the Collao is proved by its being also in the Chincha-suyu dialect.

5. *Coraquenque.*¶—Garcilasso says that this name of the sacred bird may have had a meaning in the lost court dialect. But *cora* is one of the words for pasture in the general language. The name for this same bird in "Aymara" is *alcamari*** and not *coraquenque.*

6. *Hahuanina,* the name of the lineage of one of the Yncas. But it is composed of two common Quichua words, *huahua* (a child), and *nina* (fire).

7. *Panaca,* the name of several of the Ynca lineages. Probably from *pana* (sister of a brother) and *ca,* the ancient form of the genitive.

8. *Raurana,* a participle of the Quichua *raurani* (I burn).

9. *Socso,* derived from the Quichua *socsuni* (I am weak).

10. *Usca,* from the Quichua *uscani* (I beg).

11. *Vicaquirau*; no doubt from the Quichua *quirau* (a cradle).††

Many centuries must have elapsed before an aggressive policy became a leading feature of the government of the Yncas, and, baseless as the chronicle of Montesinos certainly is, the Ynca civilization is much more likely to have required a period represented by his hundred Yncas, than by the dozen of the more generally reliable authorities, for its full development. But that aggressive policy must have been long in the ascendant

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* Part I. lib. i. cap. 18. But Montesinos says that heaps of stones are called *Cuzcos,* in the general language, p. 6.

† Part I. lib. i. cap. 18.

‡ Ibid. cap. 24.

§ Ibid. lib. vii. cap. 8.

‖ Also the Pleiades. See Acosta and Balboa.

¶ Part I. lib. vi. cap. 28.

** Bertonio, Dicc.

†† These last six words from G. de la Vega, Part I. lib. ix. cap. xl.

and successful, before those Cyclopean edifices can have been undertaken, which form the most ancient of the Peruvian architectural remains: for they involve the forced labour of thousands of conquered people. The various styles of Ynca architecture roughly indicate the period when each country, where ancient buildings are found, was conquered; and it is, therefore, necessary to describe them briefly, in an attempt at the classification of the component parts of the Ynca empire.

Ynca architecture is divided into five styles, each representing a long period of time. The earliest consists of walls of unhewn stones and mud, built on terraces or platforms, and used as fortresses as well as palaces. Such buildings were erected by all the nations of the Ynca region, and the best example of a *pucara*, or fort of those primitive times, is probably at Curampa, on the road from Antahuaylas to Amancay. Next come the Cyclopean ruins, which are also prehistoric. They must have been undertaken after the Yncas had conquered a wide extent of country, and thus commanded unlimited supplies of labour, but before they had developed that enlightened economy and skilful avoidance of waste of power which distinguished the later period of their rule. Each edifice of this early style has a common character which stamps it as of Ynca origin, while there is originality in detail both in the buildings of this and of the later periods. The Cyclopean style of the Yncas is characterized by enormous blocks of stone, unwrought, except where they fit into their neighbours with marvellous precision, by great slabs and stone beams, by a tendency to carve rough figures on the stones and lintels, by colossal but very rude statues, and by seats, stairs and recesses accurately cut out of huge monoliths, or even out of the living rock. All such works appear generally to have been undertaken by one sovereign, or possibly by two succeeding ones, and then to have been left unfinished; with the possible object of employing a turbulent but subjugated people, while feeding the vanity or pleasing the taste of the conqueror. There are five of these Cyclopean ruins which mark the limits of Ynca conquest, in very remote and prehistoric times, as extending from the southern shore of Lake Titicaca to Huaraz, beyond the ridge of Pasco. They are:—1. The ruin in the Calle del Triunfo (in Cuzco); 2. Ollantay-tampu; 3. Tiahuanacu; 4. Huiñaque; and 5. Huaraz.

I believe them to be very ancient, and to be prehistoric in the same sense as the Stonehenge is prehistoric, because there was no tradition or knowledge of their history or origin among the Yncas or their subjects at the time of the conquest. I believe them to be of Ynca origin, that is to say, to have been erected

by the same imperial and conquering race which formed the vast empire of later times, because, with many varieties in detail, they bear the stamp of one idea, and have all their main characteristics in common. The two first are included in the original province of the Yncas now under notice, and will be briefly described here. The others will come under review when we treat of the regions in which they are situated.

The ruins in the Calle del Triunfo, at Cuzco, with their "stone of twelve corners," consist of enormous blocks with rough surfaces, admirably fitted into each other with absolute precision. Modern tradition calls them the palace of Ynca Rocca; but that monarch's abode was in quite another part of the town;* and the builders and occupiers of this mighty pile are as unknown as those who raised the Stonehenge.

At Ollantay-tampu, on the northern frontier of the original Ynca realm, there are buildings of three different styles and dates. The Cyclopean remains consist of six curious slabs of immense size, apparently intended as the inner wall of a hall, with smaller pieces fitted with exquisite exactness between them. There are also immense stone beams—one 15 feet 4 in. long, by 8 feet 4 in.; and another, known as the *tired stone*, 20 feet 4 in. long, by 15 feet 2 in. broad—Cyclopean walls, and vast seats and recesses hewn out of the living rock. Figures of men and animals were carved on the stones.† These remains are also prehistoric, and their present name merely refers to the title of a dramatic composition of a later period, the scene of part of which is placed among the ruins.

The great fortress of Cuzco, though Cyclopean as regards construction, is not prehistoric, and therefore does not come within this category. Its originator, the occasion of its being erected, and even the architects are known; and the ancient style, which had been discarded for ordinary buildings, was deemed suitable for a fortress intended to be impregnable, and was accordingly imitated by a later generation for this special purpose.

The third style of architecture shows a great advance in civilization. More enlightened rulers saw the enormous waste of power involved in dragging and raising stones weighing many tons. The same pattern was retained, walls were still built of polygonal-shaped stones with rough exterior surfaces, and fitting exactly to each other; but they were much reduced in size, and could be conveyed and raised to their places by the efforts of a few men. Rows of doors and recesses for *huacas* now appear, with stone lintels and slanting sides. The outer

* G. de la Vega, I. lib. vii. cap. 10. † Cieza de Leon, cap. 94.

front of the Collcampata or traditional abode of Manco Ccapac, the older portion of the Ccuri-cancha or Temple of the Sun, and the palaces at Rimac-tampu, Yucay, Ollantay-tampu, and Chinchero belong to this period. I believe the edifices of the third style to be prehistoric also, because all the buildings of which anything is really known are of later date.

The fourth style is characterized by more regular courses, but in which the stones are not all regular parallelograms, in some cases the upper and under stones fitting into each other, or dove-tailing. These walls usually have a cornice below the highest course.

The fifth style has perfectly horizontal courses, and stones exquisitely fitted, but with slightly projecting surfaces, analogous, as Mr. Fergusson observes, to our rustication. In this latest and most perfect style we meet with rectangular doorways, recesses and windows. The eastern side of the Temple of the Sun, the inner buildings on the Collcampata, and the whole of the Ynca palaces at Cuzco, as well as most of the buildings figured by Ulloa and Humboldt in the Quitu region, belong either to the fourth or to the fifth and latest style.

I can now explain my grounds for treating all the earlier Yncas (whose names are given in various recorded lists) as prehistoric from an architectural point of view. Each Ynca had a separate palace at Cuzco, and, though other considerations support the same conclusion, I consider none as historical personages unless their abodes can be identified. The traditional site of the abode of Manco Ccapac may be set aside as mythical, because the remains are partly of the third and partly of the latest style. The most ancient palace that can be identified is that of Ynca Rocca, in a place formerly called the Cora-cora. Portions of the walls still exist, and they belong to the very latest style. The walls of the palaces of Uira-ccocha, Pachacutec, Ynca Yupanqui, Tupac Ynca Yupanqui, and Huayna Ccapac are also in regular courses of the latest style. These are the historical Yncas. The earliest of them may have flourished 200 years before the conquest, at the outside; and this is as far back as memory, aided by *quipus*, could well go, and retain any appreciable amount of credibility. All earlier styles of architecture are therefore prehistoric, and countries where they are found must have been subdued by the Yncas previous to the reign of Ynca Rocca; while countries where only the latest style is met with furnish this architectural proof that they were conquered by the Yncas within historical times. Detailed history, based on native information (discarding the absurdities of Montesinos), is only to be met with in the pages of the Ynca Garcilasso; but, so far as it goes, it

confirms the above conclusion. In none of the countries said, by Garcilasso, to have been subdued by the historical Yncas, are the Cyclopean or polygonal styles met with. The earlier prehistoric conquests are divided among five mythical Yncas, a totally insufficient number, and in the scenes of all these conquests the earliest styles are found. They form silent but indisputable testimony that the Ynca conquests had reached certain limits in a period of unknown antiquity, while the unhistorical character of all Garcilasso's narrative, until he reaches the time of Ynca Rocca, is shown by the absence of incident and the weary sameness of each alleged conquest. Certain countries had been subdued before the memory of living man, and further back than any tradition reached. Garcilasso's informants had to divide the conquests of these countries among a small number of names which alone lingered in the traditional lore of the *amautas;* but the first part of the narrative is too symmetrical for real history. The early styles cannot have had their origin among any other people than the Yncas, because they occur both to the north and to the south of Cuzco, among very distinct races, as well as in the home district of the imperial tribe itself; and must, therefore, necessarily be referred to the common centre.

The sculptured stones and statues of the most ancient Cyclopean style disappear, to a great extent, in later times, when ingenuity and originality of that kind were mainly lavished on the plastic art. Yet sculpture was not altogether abandoned, and serpents, especially, are found carved on the walls and lintels of palaces of the historical Yncas. Comparisons between stone sculptures and designs on vases of clay, stone, and the precious metals, throw much light on these questions; and a close critical examination of the designs on vases would, in all probability, furnish reliable data for their classification as regards chronology and nationality.

The above considerations respecting the styles and periods of Ynca architecture have an important bearing on questions relating to the separation of Ynca from indigenous elements in the classification of the tribes.

I now proceed to notice the other nations in the Ynca region.

2.—The Canas.

On the saddle which divides the drainage of the Ucayali from that of Lake Titicaca, there is a small tarn, whence the waters flow on one side to the Atlantic and on the other to the inland sea. This lake marks the boundary between the Ynca and Colla regions, and a hardy mountain race, divided into

several tribes, of which the chief was that of the Canas, inhabited the vale of Vilcamayu, from the source of the river to Quequesana, where the Ynca territory began, including the mountain districts on either side. These people were divided into *Ayaviris, Canas, Canches,* and *Caviñas.*

The *Ayaviris* were a very stubborn and independent people, forming a buffer between the Collas and Yncas, with both of whom they waged fierce wars in the days before their final subjugation. They are said by Cieza de Leon to have been a branch of the Canas.

The *Canas* inhabited the country on the left bank of the Vilcamayu, from the border of the Ayaviri country to Quequesana. They were described as a proud, cautious, and melancholy race of shepherds, clothing themselves in dresses of sombre colour, and using sad and plaintive music. They built their villages in naturally strong positions, and, besides their flocks, raised *papas* and *ocas* on the banks of the alpine lakes which feed the river Vilcamayu. They were constantly in revolt against the Yncas.

The *Canches* inhabited the country opposite the Canas, on the right bank of the Vilcamayu. They were of middle height, bold, restless, inconstant, but good workmen and industrious. They loved solitude, were very silent, and built their huts in secluded ravines and valleys. They wore a black fillet round the head, with the ends hanging down as low as the chin. After they were subjugated by the Yncas, the Canas and Canches settled in villages in the fertile vale of Vilcamayu, but formerly they confined themselves to the high lands on either side, and were in a state of constant war. Bertonio says that they spoke the language of the Collao, but he was hopelessly confused by the numerous dialects around him in the mission at Juli. The Canas and Canches really spoke a dialect of the Ynca language.* Their mode of burial was also similar to that of the Yncas. They built stone *machays,* or recesses, on the heights for their dead.

The *Caviñas* appear to have been the aboriginal inhabitants of the upper part of the Vilcamayu valley, having the warlike Canas and Canches on the hills on either side of them. They wore woollen clothes with a black fillet round their heads. They are said to have held a temple or shrine in great veneration at a place called Ausancata, and they believed that the souls of the departed went to a certain great lake where the tribe had its origin, and there again entered the bodies of the newly born.

* 'Mercurio Peruano,' i. p. 200 (ed. Lima, 1861).

Garcilasso asserts that they had an idol of fearful form, to which they offered very barbarous sacrifices.

3.—The Quichuas.

The Apurimac divided the Yncas from a closely allied nation, speaking the same language, called Quichuas. In ancient times it is said that these Quichuas occupied the valleys of Abancay and Andahuaylas, and all the country between the Apurimac and the Pampas, but that they were driven out by their enemies the Chancas. In the time of the Spanish conquest their homes were in the upper parts of the valleys of the Pachachaca and other tributaries of the Apurimac, extending, east and west, for 120 miles in a straight line, from that river to the Pampas. In their rear, to the south, were the lofty uninhabited *punas* of the Cordillera. Their territory consisted of uplands covered with long grass, and profound gorges and ravines. Mossi derives the name of Quichua from the abundance of straw in this region. *Quehuani* is to twist, *Quehuasca* is the participle, and *ychu* is straw. Together, *Quehuasca-ychu*, "twisted straw," corrupted and abbreviated into *Quichua*.

The Quichuas were divided into six *ayllus*, or lineages, namely, the *Yanahuaras*, *Chumpi-vilcas*, *Cotaneras*, *Cotapampas*, *Aymaras*, and the *Umasayus*.

The *Yanahuaras* were a tribe occupying the left bank of the Apurimac.

The *Chumpi-vilcas* were also on the left bank of the Apurimac, but higher up the valley. These Chumpi-vilcas were renowned as the best dancers of the Ayrihuay. At harvest time they hung fertile stalks of maize, called *Huantay-sara*, and *Ayrihuay-sara*, on branches of trees, and danced round them, afterwards burning them as a sacrifice.

The *Cotaneras* lived in the deep ravines further west. They were granted in *encomienda* to the Ynca Garcilasso's father.

The *Cotapampas* were Indians living on the wild mountains westward of the Cotaneras.

The *Aymaras* lived in the upper part of the valley of the Pachachaca. Calancha says that they were clever Indians, but great idolaters.

The *Umasayus* were a race of shepherds, bordering on the Aymaras, in the wild pasture country towards the river Pampas.

These Quichua tribes were staunch and loyal friends of the Yncas, and they are recorded, within the historical period, as having turned the scale in favour of the Ynca Uira-ccocha, in his great life-and-death struggle with the Chancas. Their language is that of the Yncas, and the specimens (collected by

Dr. Justiniani) of songs by the Aymara and Cotapampa Indians prove it to have been uncorrupted by foreign words. But the name Quichua is inappropriate as that of the language of Peru, and absurd as that of the Peruvians generally. It should have been called the Ynca language. All the old writers call it "la lengua general," and "la lengua cortesana;" and it was first called *Quichua* by Friar Domingo de San Tomas, not in his grammar, but in his vocabulary, published at Valladolid in 1560. He possibly first collected lists of words in the language, among the Quichuas, and therefore called his vocabulary by their name, which was adopted by all subsequent grammarians.

4.—THE CHANCAS.

The warlike and turbulent Chancas appear to have had their original seat round the sites of Huamanca and Huanta; but, driving the Quichuas further up the valleys, they eventually extended their dominions to the left bank of the Apurimac.* They claimed descent from a puma, and on great festivals they clothed themselves in puma skins, with their heads thrust into the skulls. They told Cieza de Leon that their fathers came out of a small lake called Soclo-cocha, and this lake was their chief place of worship, where they prayed and made sacrifices. The Chancas were divided into the following *ayllus*, or lineages:—*Hancohuallus*,† *Utunsullas*,† *Urumarcas*,† *Vilcas*,† *Yquichanos*, *Morochucos*, *Tacmanas*,† *Quiñuallas*† and *Pocras*.‡ Of these, the Urumarcas § lived in the valley of the Pampas, the Vilcas on the plateau above its left bank, the Pocras in the valleys round the present city of Ayacucho, the Yquichanos in the mountains above Huanta, and the Morochucos in Cangallo.

Hervas supposes that the Chancas spoke a language which was different from the Yncas, and which has disappeared. This is very likely, for many of their words were very distinct, such as *yacu* for water, instead of the Quichua *unu*. These distinctive words point to their dialect as having been allied to the language of the people of Chincha-suyu further north. The Chancas were first subdued in prehistoric times, and edifices in the Cyclopean or second style of the Ynca architecture were found in the centre of their country, at a place near the river Huiñaque. Cieza de Leon notices the differences between these ruins, and those referable to the historic Yncas, and it is clear from what he says, that all memory of their origin had passed away. The existence is also recorded of a colossal statue ornamented with serpents and lizards carved on the stone. It took that barba-

* Cieza de Leon, cap. 90. † 'Comm. Real.' I. lib. v. cap. 19. ‡ Ib. cap. 24.
§ Cieza de Leon, cap. 89.

rous old Jesuit, Arriaga, with the help of thirty men, three days to break it to pieces. At Vilca, also in the country of the Chancas, there were palaces, temples, and baths of the latest style of Ynca architecture. Yet, notwithstanding all these evidences that their country was subjugated in very remote times by the Yncas, the Chancas appear to have been constantly rebelling, and on one occasion they very nearly overthrew the empire of their conquerors. But, with the aid of the loyal Quichuas, the bloody battle of Yahuar-pampa was decided in favour of the imperial race; and Hancohuallu, the brave chief of the Chancas, unable to brook defeat, emigrated to the forests of the Huallaga valley with a large body of devoted followers. This was about 150 years before the arrival of the Spaniards.

5.—The Huancas.

The most northern part of the Ynca region, including the valley of Sausa, the shores of Lake Pumpu or Chinchaycocha, and the surrounding mountains, was peopled by a nation called Huancas, who were divided into the following tribes or lineages:—The *Sausas*,* *Huancavilcas*,* *Llacsapalancas*,* *Pumpus*,† *Chucurpus*,† *Ancaras*,† *Huayllas*,† and the *Yauyus*.‡

The Huancas were described as a warlike people, who burnt their prisoners taken in war, preserving a few bits of skin out of the ashes, which they placed in their temples as trophies. They also made drums of the skins, saying that their enemies would hear them, and knowing they were the skins of their people, would run away at the sound. Their villages were small and well fortified, with stone towers, broad at the base, and narrow above. These Huancas believed that they derived their origin from a man and woman who came forth from a fountain called Huarivilca, over which they built a temple. They are also said to have worshipped dogs. They fought with slings and lances, and had many feuds respecting the boundaries of their properties. We learn much concerning the customs of the Huayllas and Yauyus from the Jesuit Arriaga. There was a *huaca* common to the whole tribe, as well as household *huacas* in each family. The *malquis* were venerated as among the Yncas, and the reason given by the people for this cult was *cuyaspa, i.e.* "for the love they bore them." The offerings made to the *malquis* were cloths, plumes, jars, vases, skins of foxes and lions, and horns of deer. The women, at seed time, invoked the earth as *mama-pacha;* the fountains and rivers also had their *huacas*, and great stones had special names, and were worshipped

* G. de la Vega, I. lib. vi. cap. 10.
† Ibid. cap. 11. ‡ Ibid. cap. 16.

with a thousand tales and fables of their having once been men turned into stones. There were many soothsayers or diviners by dreams, odds or evens, and the feet of hairy spiders. These superstitions, or similar ones, though told of a branch of the Huancas, were current among all the tribes in the Ynca region. I find most of them alluded to in the Quichua drama of "Ollanta."

The Huancas spoke a language which was more distinct from that of the Yncas, and contained more words derived from their northern neighbours than the Chancas.* I am uncertain whether the Huancas and Chancas originally belonged to the Ynca or the Chincha-suyu race.

6.—THE RUCANAS.

Tribes of hardy and stalwart mountaineers inhabited the wild region of the maritime Cordillera to the south-west of the Chancas, on both the Ucayali and the coast watersheds. I find four mentioned, namely the *Rucanas, Soras, Collahuas,* and the *Huamanpalpas.*

The *Rucanas* † were described as a handsome and well-disposed people, who were expert bearers of burdens, and had the privilege of carrying the Ynca's litter. Their country was on the coast watershed.

The *Soras,* ‡ closely allied to the *Rucanas,* lived on the left bank of the Pampas near its source, and were neighbours of the Aymaras.

The *Collahuas* § were on the seaward slopes of the Cordillera, below and south of the *Rucanas.*

The *Huamanpalpas* ‖ dwelt further to the north and west, in Cangallo.

The Rucana tribes appear to have been more allied to the Quichuas than to the Chancas as regards language. They use the word *unu,* and not *yacu,* for water, which is one of my tests; and I should class them almost as a branch of the Quichuas.

The above are the ethnological divisions of the Ynca region. The Yncas, Quichuas, Canas, and Rucanas are closely allied and are but branches of one great family; while the languages of the Chancas and Huancas contain a great number of foreign words, which make it doubtful whether they should be classed with the Yncas or with their northern neighbours in Chincha-

* I am aware that von Tschudi speaks of a language spoken in Yauyos, called *Kauqui;* but I have not met with any mention of it in any other author, and von Tschudi only gives the name, and says that but few words have been preserved.—*Travels,* p. 488.

† G. de la Vega, lib. iii. cap. 18; lib. vi. cap. 3; lib. viii. cap. 9.

‡ Ibid. lib. iii. cap. 18. Balboa.

§ Ibid. lib. iii. cap. 9.

‖ Ibid. cap. 12.

suyu. The six nations occupied a rich and highly favoured region, yielding all the products needed by civilized communities, yet calling forth the full energies of its inhabitants to open communications, convey materials, and supply necessary irrigation. In a long course of ages the six nations probably worked out these ends by separate roads, until increasing population brought them in contact with each other, when a struggle for supremacy ended in the mastery of the fittest—the Yncas. Such people were sure, in the course of time, to overcome more distant tribes living in regions less favoured by nature, even though they might have been originally of the same race.

II.—The Collao Region.

The country forming the basin of Lake Titicaca is about 300 miles long by 150 broad, bounded east and west by the mighty chain of the Andes and the coast Cordillera, with the saddle of Vilcañota, that connects the two chains, as its northern limit, and with all the drainage from these surrounding mountains flowing into the great lake. The region thus enclosed is 12,000 feet above the level of the sea, a hilly and broken plateau where no corn, save quinua, will ripen, and only yielding edible roots and coarse pasture for llamas and alpacas,—a bleak and treeless series of unproductive plains and uplands. Such a country was not adapted for the development of indigenous civilization; and before the Ynca conquest, it was inhabited by the rudest and most savage tribes in the Andes. Without corn, without timber, they dwelt in stone huts, tended their flocks, raised crops of ocas and papas, and engaged in incessant feuds. They were brave and warlike, but their only arms were slings and *ayllos* or bolas; so that they suffered much in encounters with the better armed soldiers of the civilized Indians to the north.* Their language, though it has different terminations for the numbers and cases of nouns, and numbers and persons of verbs, must be classed as but a dialect of the Ynca or Quichua language. It was so rough and uncultivated, and those who used it were so barbarous, that they could scarcely speak it themselves.† The system of numerals was most imperfect, and originally barely reached to counting 4, if so far, for 3 is borrowed from Quichua, as well as 5, 6, and 10; and all the rest are compound. The language contained few words to express abstract ideas, and none for many things which are indispensable in the first beginnings of civilized life. The Yncas appear to have called all the inhabitants of this region by

* Balboa, p. 151.

† Blas Valera; quoted by G. de la Vega, Part I. lib. vii. cap. 4.

the general name of Collas, because the Collas were the first tribe they encountered after entering the basin of Lake Titicaca, and they were followed by the early Spanish writers, who named the region forming the basin of Lake Titicaca, the Collao. It was conquered by the Yncas in very remote prehistoric times, and they conferred incalculable benefits on the inhabitants by teaching them a cultivated language and the arts of civilized life, forming them into colonies in more genial regions, and establishing an interchange of products between the colonists in the coast valleys and the eastern forests, and their brethren on the bleak plateaux of the Collao.*

The original inhabitants of the Collao or Titicaca region, consisted of the following tribes:—The *Collas*, the *Lupacas*, the *Pacasas*, the *Carangas*, the *Quillacas*, the *Urus*, and the *Collahuayas*.

The *Collas* inhabited the country to the north of Lake Titicaca. They were first described by Cieza de Leon, who tells us that they relate many fictions, but that no sense can be learnt from them concerning their origin. He says that the native chiefs were treated with great respect, and travelled in litters with a large retinue. But he was most struck by the *chullpas*, or burial places, and he describes the funeral ceremonies as well as the dances at harvest time. The name *Colla* is preserved in two villages called *Hatun* and *Paucar Colla*, where the Yncas erected various edifices; but the civilizing influences of the conquerors were so powerful that the original language has entirely disappeared, and now even the names of villages are nearly all composed of words belonging to the Ynca language.

The *Lupacas*† occupied the western side of Lake Titicaca, as far as the River Desaguadero: their territory being comprised in the present province of Chucuito. They retained the use of their ancient language, though receiving numerous words from their masters, some in substitution of old words of their own, but most to express things and ideas of which they had no knowledge before they were instructed by the Yncas.

The *Pacasas*‡ were a large and populous tribe inhabiting the whole eastern shore of Lake Titicaca, and the country to the south as far as Callapa. They were divided by the Yncas into two provinces; namely the Pacasas of *Uma-suyu*, or the water district, to the east; and those of *Urco-suyu*, or the hill district, to the south of the lake. They also retained their

* See G. de la Vega, Part I. lib. vii. cap. 1. † Bertonio.
‡ D'Orbigny, 'Voyage,' ii. p. 392. Garcilasso calls the *Pacasa* tribe by the name of *Cac-yaviris* (I. lib. iii. cap. 2).

ancient language, which was almost identical with that of the Lupacas.

The *Carangas* * and *Quillacas* † were tribes in the southern part of the basin of Lake Titicaca.

The *Urus* ‡ were a savage tribe inhabiting the shores and islands in the southern part of Lake Titicaca. Calancha calls them *Ochozumas*. The beds of rushes in the shallow parts of the lake are in some parts nine leagues long and even more. Here these wild people lived, making secret lanes through the rushes, and navigating them in floats made of long bundles of rushes lashed together. Ramos says that they were little better than beasts, and that they lived in miserable huts in islands among the rushes. But they were very expert boatmen, and were employed to take charge of ferries in many parts of Peru.§ They spoke a barbarous patois called *Puquina*, of which we have only the Lord's Prayer, and a few other specimens, furnished to Bishop Orè, by Father Alonzo de Barzana.‖ These specimens contain several Quichua words, and what remains, appears to be a very rude dialect of the Lupaca, with many syncopes; but it is impossible to judge definitively without seeing a grammar.

The *Collahuayas* ¶ were a small tribe inhabiting the mountainous province of Larecaja, to the eastward of the great peaks of the Andes. They are famous in all parts of South America for their knowledge of the virtues of herbs. Collecting a stock in trade in the eastern forests, they wander over thousands of miles, from village to village, as professors of the healing art. With many words peculiar to themselves and to their trade, they now speak a dialect based on the language of the Yncas.

Other tribes to the south and east of the Titicaca basin, in Cochabamba and Charcas, also spoke the Ynca language.**

The Titicaca tribes may be taken as members of one stock, speaking rude dialects of the language of the Yncas, which were found in their best form among the Lupacas and Pacajes. The country they inhabited, now known as the Collao, was

* G. de la Vega, I. lib. iv. cap. 20. Ramos, cap. 7. D'Orbigny, 'Voyage,' iii. p. 317.

† The *Ullaca*, in the 'Royal Commentaries,' is, I think, a misprint for *Quillaca*. See also D'Orbigny, ii. p. 472.

‡ D'Avalos y Figueroa, p. 142. Calancha. Ramos, cap. 30. Conde de Castellar, p. 187. Príncipe de Esquilache, p. 96. Acosta, lib. ii. cap. 61, who says that the Urus are so brutal that they do not consider themselves as men, saying that they are not men but *Urus*, as if they were another class of animals, p. 96. Balboa, p. 143.

§ 'Ordenanzas de Toledo,' lib. II. tit. ix. Ord. 28.

‖ 'Rituale Peruanum,' Hervas, i. p. 245.

¶ Miller's 'Memoirs,' ii. p. 339. Weddell's 'Voyage.'

** As well as the *Colchaquis*, in Tucuman.

not adapted for the development of a civilized community, but rather of a warlike race of hardy shepherds. Such the Titicaca tribes appear to have been, and their only really aboriginal remains are rude stone walls thrown up as fortresses, and the earliest forms of *chullpas*, or burial places, such as those described by Mr. Squier near Acora, in the country of the Lupacas. They consist of stone slabs, some 6 feet high, set in a circle or square, and supporting blocks which form a roof.

But the Collao was overrun by the armies of the Yncas in very remote prehistoric times; and the most extensive and imposing remains of their second or Cyclopean style are at Tiahuanaco, on the southern shore of Lake Titicaca, in the country of the Pacasas. These vast unfinished works may well have been commenced to commemorate a mighty conquest, and to employ a defeated but numerous and warlike foe. Cieza de Leon, who was the first to describe the Tiahuanacu ruins, asked the natives when they were built. He was told that they were made before the Yncas ever reigned, but his informants could not say who made them. They added that they had been told by their fathers that all he saw was done in one night.* The latter statement vitiates all the information received by Cieza de Leon. The Indians with whom he conversed were evidently ignorant and uneducated, and knew nothing about the matter. Polo de Ondegardo was the next Spaniard who instituted inquiries respecting the Tiahuanacu ruins. He was a sagacious lawyer, accustomed to weigh evidence, and, as Mr. Prescott† says, he was conscious of having derived his information through the most authentic channels. He investigated these questions with much care, and he tells us that the Tiahuanacu ruins are unfinished works of the early Yncas. This view is confirmed by their family likeness to all the other Cyclopean works of the Yncas. Here are the enormous accurately chiselled blocks and seats as at Ollantay-tambo and the Rodadero, and the colossal statues and sculptured stones as at Ollantay-tambo and Huaraz. Although the more ancient work at Tiahuanacu is prehistoric, additions appear to have been made by later Yncas, and within historic times. Garcilasso de la Vega tells us that a great part of the Tiahuanacu ruins were attributed to Acahuana Ynca, one of the architects of the fortress at Cuzco.‡ Mr. Squier refers to this later work at Tiahuanacu, which he distinguishes from the more ancient stones, the latter being unhewn, and the former cut with much elaboration.§ Each of the Ynca Cyclopean ruins have some original conception, marking the indivi-

* See my translation, p. 179.
† 'Conquest of Peru,' i. p. 164.
‡ 'Comm. Real.' I. lib. vii. cap. 29.
§ 'Primeval Monuments of Peru,' p. 16.

duality of the designer, while they all preserve the general characteristics which stamp them as the work of the same people. Tiahuanacu is renowned for its monolithic doorways. The sculptures on the great doorway, in alto-relief, consist of a central figure holding a serpent in each hand, and three lines of smaller figures, those in the middle line having heads of some bird, apparently a condor. Though carved with wonderful boldness, they are excessively rude, and, as is to be expected, far inferior to the Ynca designs of a later period. D'Orbigny* and others have invented elaborate theories to explain a symbolical meaning, which there are no grounds for supposing that these sculptures ever possessed, thus displaying the fertility of modern imaginations, but obscuring rather than throwing light upon ancient history. The central figure of the Tiahuanacu doorway is nearly identical with one which frequently occurs on vases, gold and silver cups, and war clubs of the Yncas. As regards the condor figures, the mighty birds of the Andes form a common ornament on Ynca designs.† These considerations point to the Yncarial origin of the Tiahuanacu ruins. They mark the southern, as those at Huaraz do the northern limit of Ynca conquest during the time that their second architectural style prevailed.

The later remains of Ynca rule in the Collao‡ are chiefly to be met with on the islands of Lake Titicaca; and are the work of that famous sovereign Tupac Yupanqui. He became enamoured of the great expanse of water, out of which his deity the sun appeared to rise, and he erected a temple and other edifices to its honour. Riches were prodigally lavished on these establishments, and their importance, combined with the sovereign's caprice, may have given rise to the myth, that the sun rested on the island before rising to its place in the heavens. Tupac Yupanqui removed the natives from the islands whose sacred character he had ordained, and peopled them, and the villages on the adjoining coast, with families from nearly all the loyal tribes in his empire. The *Collas* were considered too barbarous to be allowed to enter the holy precincts of the temple; a

* 'Voyage,' iii. p. 340. † 'Comm. Real.' I. lib. v. cap. 23.

‡ The fancied distinction between the Ynca and so-called *Aymara* architecture, based on the notion that doorways in *Aymara* masonry are invariably upright, whereas the Ynca doorways have their sides inclined inwards, is quite imaginary. The inclining sides are by no means universal in Ynca architecture, and are met with in their third, and occasionally in their fourth styles. In the latest Ynca style, as, for instance, at the inner ruins on the Collcampata at Cuzco, the doorways are rectangular. The *chullpas*, in the Collao, with rectangular openings, are in the fourth style of Ynca architecture, evidently designed under the direction of chiefs who had been educated at Cuzco.

There are no ruins in the Collao which are not of Ynca origin, except the earliest and rudest *pucaras* and *chullpas*.

prohibition, observes Ramos,* similar to that ordained by the Jews against the Moabites.

The most interesting point in the connection of the Yncas with these wild tribes of the Collao, is what I believe to be the evidence that, under the teaching of their conquerors, the natives developed and improved their own architectural designs. They had no temples or palaces, but they lavished all their skill on the tombs of their chiefs, and Cieza de Leon declares that he "was truly astonished to see how little they cared for having large and handsome houses for the living, while they bestowed so much care on the tombs of the dead; as if all happiness did not consist in something else." It has been seen that, originally, they constructed tombs of upright slabs arranged in a circle, with other blocks forming a roof, or in the form of a square. But these ancient attempts were improved upon when the Collas, Lupacas, and Pacasas began to receive new ideas from their masters; while the original plan of their ancestors was retained and developed. It was the policy of the Yncas to educate the sons of vassal chiefs at Cuzco, where they learnt all the arts and literature of the capital.† Thus they returned to their own land with minds enlarged by study, and by contact with a more civilized people. The *chullpas*, built under the auspices of chiefs educated at Cuzco, would naturally be improvements on the rude attempts of barbarous ancestors. Mr. Squier, in his able and suggestive pamphlet, has traced out the evidence of gradual improvement in the construction of the *chullpas*. The first step, shown in the ruins of Quellenata, was from the rude tombs at Acora to round towers of considerable height, built with roughly hewn stones. Then come such tombs as those at Ullulloma, which are imitated from the third Ynca style of architecture, and must, therefore, be very old. Lastly, we come to *chullpas*, in which the fourth Ynca style is closely imitated. These are square as at Escoma, or like that in Caranga, given in D'Orbigny's work; or round as at Sillustani. The burial towers at the latter place, on a promontory jutting into the alpine lake of Umayo, are circular, and so far they follow the plan of the earlier Collao tombs. The niches, to receive the bodies, take the place of the *machays* near Cuzco. The masonry is identical with that of the fourth Ynca style in every respect; and the lizard or serpent carved on one of the stones now fallen, but seen *in situ* by my informant Don Manuel Costas, is the very same design as is to be seen on the walls of the Ynca palaces at Cuzco. The Sillustani *chullpas* are an adaptation of the Ynca architecture to the traditional

* 'Historia de Copacabana.'

† G. de la Vega, I. lib. vii. cap. 2.

forms of the Collao tombs, and are certainly the most curious and interesting aboriginal monuments in the Titicaca region. The tower form of tombs was not peculiar to the Collao. It occurs again among the Chachapuyas. But it was doubtless of native growth; while its improved architectural style is due to the teaching of the Yncas. Mr. Squier has brought out this evidence of progressive improvement in the *chullpas* of the Collao very clearly. Cieza de Leon thought that the differences in the *chullpas* merely denoted the rank and wealth of those who built them;* but nevertheless the view of Mr. Squier is, I think, the correct one.

The most conclusive evidence of the barbarism of the Collao tribes, before they were civilized by the Yncas, is to be gathered from an examination of their language, which was first studied by Jesuits who settled at Juli, in the Lupaca country, in 1570. These Fathers were in the midst of families of colonists from all parts of the empire, who had been established at this point by Tupac Yupanqui, to watch over the temples on the sacred islands. Here were Canas and Caviñas of the Ynca nation, Cotapampas and Aymaras belonging to the Quichua tribe, Chancas, Cañaris, and many others; but, during the long confusion consequent on the Spanish conquest and subsequent civil wars, the Ynca language had been neglected, and a generation had grown up speaking only the dialect of their birthplace, though retaining the names of their *ayllus* and many words from their ancestral homes. Juli itself was full of Aymaras,† and this explains the deplorable blunder of the Jesuits in giving the name of "Aymara" to the language they learnt at Juli, which was in reality that of the Lupaca tribe.‡ We are told that the same language was spoken in greater purity by the Pacasas, on the other side of the Desaguadero.§ *Aymara* is applied to the language of the Lupacas and Pacasas in one of the 'Ordenanzas' of the Viceroy Toledo; in which a Jesuit of Juli, named Gonzalez Holguin, who was learned in the languages of Peru, is appointed Interpreter-General.‖

An Italian, named Ludovico Bertonio, studied the Lupaca dialect for many years, and published a grammar in 1603, and a very copious and valuable dictionary at Juli in 1612; and another grammar, with a short vocabulary, was published at

* My translation, p. 364. See Mr. Squier's pamphlet on the 'Primeval Monuments of Peru.'

† Blas Valera, quoted by Garcilasso, Pt. I. lib. vii. cap. 4.

‡ The whole question respecting the misapplication of the word *Aymara*, and the origin of the blunder, will be found fully discussed in the Appendix to this Paper.

§ Bertonio. ‖ Tit. xv. p. 84.

Lima in 1616 by the Jesuit Torres Rubio. We also have specimens of the language in the 'Rituale' of Bishop Uré, and in the Gospel of St. Luke by Don Vicente Pasos-kanki, printed in 1829. A life of Christ in the Pacasa dialect was written by D. B. de Merian, of the diocese of La Paz, the manuscript of which is now in the possession of Mr. Squier.

An examination of these works will show that a great number of words are borrowed from the Ynca language, while the structure of the grammar, in the Ynca language, is identical with that in the Lupaca and Pacasa dialects.

It is, therefore, more correct to class the tongues spoken in the Collao as mere dialects of the Ynca or Quichua language. They have the same number of transitive verbs, and the same method of forming them; the same inclusive and exclusive plurals of verbs and pronouns; the same forms for varying the meaning of verbs; and the number of Quichua roots in the Collao dialects is very great. The differences in declining and conjugating nouns and verbs are only sufficient to justify the Lupaca and Pacasa being classed, with those of Chincha-suyu, as Quichua dialects. These differences are as follows:—

NOUN.

	YNCA.	LUPACA.
Sing. Gen.	—— p, pa.*	—— na.
,, Dat.	—— pac.	—— taqui.
,, Acc.	—— cta.	(same as nom.)
,, Voc.	—— ya.	—— y.
,, Abl.	—— pi.	—— mpi.
Plur.	—— cuna.	—— naca.

VERB.

	YNCA.	LUPACA.
Ind. Pres. *Sing.* 1st.	—— ni.	—— tha.
,, ,, 2nd.	—— nqui.	—— ta.
,, ,, 3rd.	—— n.	—— i.
,, *Plur.* 1st.	—— nchic ycu.	—— piscatana tha.
,, ,, 2nd.	—— nquichic.	—— piscata.
,, ,, 3rd.	—— ncu.	—— pisqui.

* A more ancient form of the Ynca genitive, occurring in the drama of 'Ollanta' and in some old songs, is in *c, ca.*

VERB—*continued.*

			YNCA.	LUPACA.
Ind. Pret.	*Sing.*	1st.	—— rcani.	—— atha.
,, ,,		2nd.	—— rcanqui.	—— ata.
,, ,,		3rd.	—— rcan.	—— ana.
,,	*Plur.*	1st.	—— rcanchie ycu.	—— apiscatana tha.
,, ,,		2nd.	—— rcanquichic.	—— apiscata.
,, ,,		3rd.	—— rcancu.	—— apiscana.
Ind. Fut.	*Sing.*	1st.	—— sac.	—— aha.
,, ,,		2nd.	—— nqui.	—— ahata.
,, ,,		3rd.	—— nca.	—— ani.
,,	*Plur.*	1st.	—— ssan. —— cu.	—— apiscatana tha.
,, ,,		2nd.	—— nquichic.	—— apiscahata.
,, ,,		3rd.	—— nca.	—— apiscana.

VERBAL TRANSITIONS.

	YNCA.	LUPACA.
1st. I—thee.	Yqui.	Sma.
2nd. He—thee.	Sunqui.	Tama.
3rd. Thou—me.	Huanqui.	Ta.
4th. He—me.	Huan.	To.

AUXILIARY VERB.

	YNCA.	LUPACA.
I am.	Cani.	Canca—tha.

PRONOUNS.

	YNCA.	LUPACA.
I.	Ñoca.	Na.
Of me.	Ñocap.	Nana.
Us.	Ñocanchic. ———ycu.	Nanaca.
Of us.	Ñocanchicpa. ———ycup.	Nanacana.
Thou.	Cam.	Huma.
He.	Pay.	Hupa.

PRONOUNS—*continued.*

	YNCA.	LUPACA.
This.	Cay.	Aca.
That.	Chay.	Uca.
Same.	Quiqui.	Quiqui.
My.	Y.	Ha.
Thy.	Yqui.	Ma.
His.	N.	Pa.

The Quichua words in the early so-called *Aymara* dictionaries prove the extent of the obligation of the people of the Collao to Ynca civilization. A comparison of Bertonio's dictionary and the vocabulary of Torres Rubio, with the Quichua dictionaries of Holguin, Torres Rubio, Mossi, Von Tschudi, and my own, will show the very large percentage of Ynca roots in the dialects spoken in the Collao. The numerals of the Ynca language, as compared with its Collao dialects, are as follows:—

YNCA.	PACASA.	LUPACA.
1. Huc.	Maya.	Maa.
2. Yscay.	Paya.	Paa.
3. Quimsa.	Quimsa.	
4. Ttahua.	Pussi.	
5. Pichca.	Pisca.	
6. Socta.	Chocta.	Chokhta.
7. Canchis.	Pacallco.	
8. Pussac.	Quimsa callco.	
9. Yscun.	Llalla tunca.	Llalla tunca.
10. Chunca.	Tunca.	
11. Chunca hucniyoc.	Tunca mayani.	
20. Yscay Chunca.	Paya Tunca.	

It will be seen that 1 and 2 are aboriginal, and perhaps 4; but 3, 5, 6, and 10 are borrowed from the Yncas, and 7, 8, 9, and higher numbers are compound. Words relating to religion, sacrifices, and ceremonial worship, are nearly all Ynca. So are the words for the sun as a sacred object (*Huilca*), as a God (*Ynti*), and as a conveyor of light and heat (*Rupay*, corrupted into *Lupi*); though the Collao people had words for the moon, stars, day and night. Nearly all the words for qualities and conditions of the mind and body are Ynca, and most of the

words relating to music and dancing, as well as those connected with irrigation and public works. The words for a village, a fortress, a bridge, an inn, a guest, a door, a window, a lake, a ravine, a tree, a bush, a stick, are Ynca; those for a chief, a father, a tribe, a woman, a province, a soldier; those for all warlike implements except a sling (*korahua*); and those for fire, bread, for all cooking and eating utensils, and the cognate verbs.

It might perhaps be suggested that these words were not borrowed from the conquerors, but that the Yncas took them from the conquered people of the Collao. Such an idea seems to me to be so preposterous that it refutes itself. But it is disproved by the fact that many of the words in question were also borrowed by other conquered nations, who received their civilization from the Yncas. For instance, the words *Auqui* (a Prince, used for a Father in the Collao), *Huarmi* (a woman, corrupted to *Marmi* in the Collao), and *Marca* (a village) are also in the Chincha-suyu language. This is a proof that they were received from a common centre, by the conquered peoples to the north and south of the Yncas, but separated from each other by hundreds of miles.

When the Ynca words are eliminated, we can form a clearer notion of the state of the people in the basin of Lake Titicaca before their subjugation, from the words that remain. Their religion consisted in the worship of animals and stones,* to which they offered woollen cloths, coca, and guinea-pigs. They believed in divination by odds and evens, and spiders' legs, and in such omens as a lizard crossing their paths, or as hearing certain cries.† At funerals they made sacrifices, some say human sacrifices, and sprinkled the blood over the tombs. At harvest time they had dances and drinking-bouts. Their only architectural attempts consisted in setting huge slabs on end round the bodies of their chiefs. Their dwellings were rude stone huts, and their occupations were tending large flocks of llamas and alpacas, and cultivating edible roots and quinua. They flattened the heads of their infants, like other tribes further north.‡ They had songs by which they preserved some memory of ancestral deeds, and they played on a sort of Pandæan pipes, made of eight hollow reeds of different lengths.§ They had a rough idea of a year of ten months, and they wove woollen

* The names of the idols of the Lupacas were:—Ano Ano, Pachapaqui, Ccapia, Huana, Hatucachi, Phokhpo collo.—*Bertonio.*

† See the questions in Bertonio's 'Confesionario.'

‡ This practice was forbidden in the 'Ordenanzas' of the Viceroy Toledo, lib. II. tit. ix. Ord. viii. p. 146.

§ 'Comm. Real.' I. lib. ii. cap. 26.

cloths. In their incessant feuds their only arms were *bolas* and slings; and their subsequent history seems to show that they were brave, fierce, and cruel. There is no ground for believing that they were ever anything more than a race of barbarous uncultured shepherds, before they came under the humanizing influence of their conquerors, nor that there ever existed any form of civilization in the basin of Lake Titicaca, except that introduced by the Yncas.

III.—THE CHINCHA-SUYU REGION.

The Cordillera of the Andes, for a distance of 450 miles from the knot of Loxa to Cerro Pasco, with the valley of the Marañon on one side and a part of the coast watershed on the other, was known to the Yncas as the province of Chincha-suyu. It was inhabited by tribes speaking a language which differed very considerably from that of the Yncas as regards its vocabulary, though the grammar is almost the same.

The tribes of Chincha-suyu, enumerated by early writers, are as follows:—1. *Huanucus;* 2. *Conchucus;* 3. *Huamachucus;* 4. *Casamarcas;* 5. *Chachapuyas* or *Chachas;* 6. *Huacrachucus;* 7. *Huancapampas;* and 8. *Ayahuacas* (Cassas, Calluas, Ayahuacas).

The region inhabited by these tribes consists of two ridges of the Andes, with the river Marañon flowing between them, and the country is very mountainous and rugged, in some parts almost inaccessible. Commencing from the south, the first people were the *Huanucus*, who were strong and healthy, owing to the excellence of the climate, where the warmth is not heat, and the coolness is not cold. They built forts on the hill-tops, and were engaged in constant feuds. The Ynca palace at Huanuco, with its six portals, is one of the finest specimens of their fourth style of architecture.

Next come the *Conchucus*, in the valleys of both the Marañon and coast watersheds. They also were very warlike, and made a desperate struggle for their independence. The Conchucus are said to have worshipped an idol called *Catequilla*, and ghosts called *Huaraclla*, amongst willow-trees near the villages, where voices were heard.* At Huaraz, in the Conchucu country, there were ruins in the second, or Cyclopean style of Ynca architecture.† As Tiahuanacu marks the southern, so Huaraz marks the northern point to which Ynca conquest extended in their prehistoric and Cyclopean period. The two unfinished ruins have enough in common to mark them as works of the same imperial race. At Huaraz, as at Tiahuanacu,

* Arriaga. † Cieza de Leon, cap. 82.

faces and human figures were skilfully carved on the huge blocks. Some Indians told Cieza de Leon that the Huaraz ruins were unfinished works of the Yncas, while others, more imaginative, declared that they were erected by giants who were as large as some of the great statues carved there in stone. The same stories were told to Polo de Ondegardo and Cieza de Leon, of similar statues and sculpture, at Tiahuanacu. The truth was that in both cases there was absolute ignorance on the subject among the generation then living.

The *Huamachucus*, lower down in the Valley of the Marañon, were so named from the silver half-moons worn on their heads.* They had no villages, but lived in scattered huts on the mountain sides, and worshipped stones of peculiar shapes. They employed sorcerers to seek omens in the entrails of sheep, and are accused of having offered up human sacrifices.

The *Casamarcas*† were a populous and warlike tribe, who wore a head-dress of narrow cords like a fillet, and sacrificed wives and servants on the death of their chiefs.

The *Chachapuyas* or *Chachas* inhabited the mountainous country on the right bank of the Marañon. According to Father Blas Valera, the name, in their language, signifies "a place of strong men." The men were brave and handsome, and the women were remarkable for their great beauty. Their chief god was the condor, and they also worshipped serpents. They wore woollen clothes, and their head-dress was a sling, twisted round the brows, which was also their principal warlike implement. The tombs of the chiefs (called *Protho*)‡ consisted of towers perched on the verge of precipices overhanging the Marañon.§

The *Huacrachucus* lived on both sides of the fearful gorge through which the Marañon flows. Their name is derived from their head-dress, which consisted of a black woollen cord, with white tufts at intervals, surmounted by a deer's horn.‖ They were a fierce people, and were serpent worshippers.

The *Huancapampas*¶ were inhabitants of mountains near Jaen de Bracamoras, and the *Ayahuacas*,** divided into *Cassas* and *Calluas*, extended to the borders of the Quitu region. They are said to have been split into many tribes at enmity with each other, to have had no villages, to have worshipped animals, rocks, and streams, and to have been cannibals.

It will be observed that even the native names of these tribes

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* *Huama*, a silver half-moon; and *chucu*, a head-dress.
† *Casa*, snow, and *marca*, a village. ‡ D'Avalos y Figueroa, p. 125.
§ 'Merc. Per.,' No. 22, p. 204. ‖ *Huacra*, a horn; and *chucu*, a head-dress.
¶ *Huancar*, a drum; and *pampa*, a plain.
** *Aya*, death; and *huaca*, a sacred place.

are lost, and that the names by which they were known at the time of the Spanish conquest are composed of Quichua words, generally having reference to distinctions indicated by their head-dresses. We are indebted to Father Juan de Figueredo for a vocabulary of the Chincha-suyu language, and for some notes on its grammatical construction;* and, by the elimination of Ynca words, we may, as in the case of the Collao tribes, form some idea of their condition from their language. Judged by this test, the Chincha-suyu tribes were more advanced in civilization than those of the Collao. Their language not only contained words for agricultural acts and implements, but also for irrigating and for weaving. But, beyond 4, the numerals are borrowed from the Yncas,† as well as all words for building, bridging, and road-making; while, like the tribes of the Collao, they obtained the word *marca* for a village, from their conquerors, as well as those for buildings and their component parts. The terminations, in conjugating and declining, differ less from the Quichua than do those in the dialects of the Collao; and indeed, in the Chincha-suyu, the differences appear to be mainly caused by syncope, and slovenly pronunciation.‡ The more civilized of the Chincha-suyu tribes would seem to have been serpent worshippers, and to have offered up human sacrifices. They lived in scattered huts, and not in villages, but built fortresses on hill-tops, to which they retired, with their families, in time of war. They cultivated Indian corn, roots, and fruit trees; wore woollen clothes; worked in silver and copper; and had words for many trees, fruits, and flowers. Their language, at the time of the Spanish conquest, was less adulterated with Ynca words than that of the Collao, and there is reason for believing that the Chincha-suyu was once quite a distinct, though a rude and barbarous, dialect.

IV.—THE QUITU REGION.

The Quitu region, extending over the lofty *paramos* of the Cordillera, from the knot of Loxa to Pastu, has on one side the vast forests of the Amazon valley, whose inhabitants are included in my former Amazonian list,§ and on the other the rich forest-covered country reaching to the shores of the Pacific, from

* In the edition of Torres Rubio, of Lima, 1754.

† The Chincha-suyu numerals were:—1. Collan; 2. Yscay; 3. Quima; 4. Chuscu; 5. Pisca; 6. Octa; 7. Canchi; 8. Puac.

‡

YNCA.	CHINCHA-SUYU.
—— uni	—— a'.
—— an	—— ay.
—— huanqui	—— huan.

§ See the 'Transactions of the Ethnological Society,' iii. p. 140.

the gulf of Guayaquil to the river Patia, whose tribes I have provisionally classed with those of the Quitu Cordillera.

Velasco told Hervas that there were 117 tribes in the kingdom of Quito, and that grammars and catechisms of the languages of many of them had been composed, and were in manuscript at Quito. None of these have been published, and we are thus debarred from an examination of grammars and vocabularies, which throw so much light upon tribal history. I have adopted the following classification of the tribes of the Quitu region, from the accounts of the earliest writers:—

North of Quito:—1. *Quitus*, or *Caras*; 2. *Puritacus*; 3. *Cullahuasus*; 4. *Linguachis*; 5. *Cayambes*; 6. *Utaballus*; 7. *Carangues*. South of Quito:—8. *Llactacuncas*; 9. *Ancamarcas*; 10. *Hambatus*; 11. *Muchas*; 12. *Puruhas*; 13. *Chenibus*; 14. *Tiquisambis*; 15. *Lausis*; 16. *Cañaris*; 17. *Paltas*; 18. *Zarzas*. On the Coast:—19. *Huancavilcas*; 20. *Mantas*; 21. *Caras*; and 22. *Tacamis*.

The story told by Velasco, the Quito historian, is that the ancient inhabitants, of whom nothing is known, were called *Quitu*; but that, about 500 years before the Spanish conquest, a nation from the seacoast, the *Caras*, ascended the river Esmeraldas in balsas, and conquered the whole of the Quitu highlands, being ruled by a dynasty of kings called *Scyris*, or *Caran Scyris*. The *Scyris*, or kings of Quitu, were powerful, and subjugated many neighbouring tribes. They worshipped the sun and moon, and built a temple on the equator, with tall columns for observing the solstices. Their dead were deposited in arched tombs of stone, in desert places, and stones and earth were piled over them to a great height. These tombs were called *Tolas*. They had made but slight advances in architecture, and their attempts were confined to these *Tolas*, to rude stone houses, and to fortresses on the hill-tops. They dug three or four moats round the summit of the hill to be fortified, each strengthened by a parapet, with a building in the centre.* The Caras made copper and bronze arms and tools, stone mirrors, and vases of black and red clay, and they were very expert as lapidaries, not only boring emeralds and other stones, but carving figures upon them.† They are even said to have had a system of counting and annotation, like that of the *quipus*. It consisted of a clay frame with many divisions, into which stones of different sizes, shapes, and colours were placed.‡

To the north of Quito little is recorded respecting the tribes, beyond their names. They are said to have been very dirty; so much so, that the Yncas made them pay tribute in lice, and

* Ulloa, i. p. 473. † Ibid. i. p. 466. ‡ Velasco, ii. p. 7.

they wore metal rings in their noses, whence the Yncas called them *Quella-senca* (iron nose). The most northern of all were the Carangues, a warlike and barbarous tribe, who, for an act of treachery, were massacred in great numbers by order of the Ynca Huayna Ccapac. The bodies were thrown into a small lake near the road from Pastu to Quitu, which has ever since been called *Yahuar-ccocha* (the lake of blood). After the massacres, few but boys and children, were left in the tribe, which was afterwards called *Huayna-cuna*, or the young tribe.* These Carangues are said to have been serpent worshippers.

The first important tribe to the south of Quitu was that of the *Llacta-cuncas*, which was composed of sixteen populous *ayllus*, or lineages. Next came the *Hambatus*, *Muchas*, *Puruhus*, *Tiquisambis* and *Sausis*.

The *Cañaris* were a very numerous nation to the south of the above, divided into twenty-four *ayllus*, or lineages. They are described as a handsome race, with a peculiar head-dress. The hair, worn very long, was twisted in a knot on the top of the head, and on it was fastened a circular crown of fine laths crossing each other, like a sieve, and tufts of braid of many colours were passed through the holes. The poorer sort wore a piece of calabash, and were hence nicknamed *Mati-uma* (calabash heads), instead of the variegated sieve. The *Cañaris* buried wives with their dead chiefs, and were much addicted to divination.†

South of the *Cañaris*, near Loxa, were the *Paltas*, a small tribe living in the warm ravines. They were very ugly, owing to the heads of the children being flattened by boards tied in front and behind, and gradually tightened until the age of three years. Hence *Palta-uma*, or "Palta head," was another name for ugliness among the Yncas. The *Zarzas* had their abodes in the western slopes of the Cordillera, about Zaruma.

The tribes on the Pacific coast, belonging to the Quitu region, are extremely interesting.

The *Huancavilcas*‡ inhabited the banks of the river Guaya-

* This event happened within the memory of men living at the time of the Spanish conquest, and is therefore quite historical as related by Cieza de Leon, p. 133; Balboa, p. 179; G. de la Vega, I. lib. ix. cap. 11; and Velasco, i. p. 18. The same story was told to a recent traveller as having had its scene in Carangas, a province in the far south of Bolivia, "according to a tradition still preserved in the district." The inventor of the tradition had blundered at the similarity between *Caranga* and *Carangue*. This shows the utter worthlessness of modern so-called traditions; for, to make this Bolivian tradition still more absurd, the people of the Collao were devoted followers of the Ynca in the Carangue war, and suffered severely on the Ynca side.

† G. de la Vega, lib. viii. caps. 4, 5.

‡ The name is composed of two Ynca words—*Huanca* (a drum) and *Vilca* (sacred).

quil, the sea-shore as far as the point of Santa Elena, and the islands of Puna and Muerto. They were numerous, and, at one time, powerful, being divided into eighteen *ayllus*. They had a custom of pulling out three front teeth in each jaw. They wove cotton, and dressed in cotton shirts ornamented with *chaquiras*, or small beads of gold or silver. The hair was worn long, with a garland round the head, ornamented with *chaquiras*, and they had large rings in their noses. They are said to have had idols in the shape of beasts, to which they made human sacrifices, and before which they danced and beat drums. Their tombs were round, with a vaulted roof, and openings towards the rising sun. Their arms were clubs and spears, and they flayed their enemies, filling the skins with ashes, and hanging them to the walls of their houses.*

The *Huancavilcas* had attained to no mean degree of proficiency in the art of working metals. A statue of pure gold, 6 inches high, and very creditably sculptured, was found on the island of Muerto a few years ago, as well as ornaments consisting of thin plates of gold covered with figures, and strung together like a collar. One of these collars has about a hundred figures of pelicans, the sacred bird of these people, and every figure represents the bird in a different position. As they had been stamped and not engraved, a separate die must have been used for each figure.

It was in the country of the *Huancavilcas* that Mr. Spruce found chips of transparent quartz crystal on the sea-shore, in *middings*, or refuse heaps similar to those in Denmark. The *middings* consist of fragments of pottery, and of sea-shells of four species, one of them not now found in the neighbouring sea, and must have been the refuse of a very ancient people. The story of the giants said to have landed on this coast, near Point Santa Elena, which is told by most of the early writers, is no doubt explained by the more recent discovery of fossil bones of huge mammals, where pieces of cliff have broken away on the sea-shore.†

The *Mantas*‡ inhabited the sea-coast north of the *Huancavilca* country, from Point Santa Elena to Charapoto, and were divided into eight principal lineages. Their god was a large emerald, and the *Mantas* were famous as lapidaries. They are also said to have worshipped fish and serpents. They tattooed their faces

* Cieza de Leon, cap. 56.

† Cieza de Leon, cap. 52; G. de la Vega, I. lib. ix. cap. 9; Zarate, lib. i. cap. 4; Acosta, lib. i. cap. 19; Ranking, p. 51. See also Ulloa and Humboldt, and compare Stevenson's 'Travels,' ii. p. 235.

‡ The name is from a dangerous fish called *manta*, which attacks the pearl-divers.—*Noticias Secretas*, p. 549.

with pointed stones,* and flattened the heads of their children until they were four or five years old. They lived by fishing.

The *Caras* also lived on the coast, from Charapoto to the Cape of San Francisco; and the fable points to them as the conquerors of Quitu. The Indians of one branch of this tribe, called *Passaus*, are said to have been very barbarous, painting their faces, living in the hollows of trees and under rocks, and going naked. Garcilasso saw them fishing in their balsas, when, on his way to Europe in 1560, his vessel stopped to get in wood and water at Cape Passaus.

The *Tacamis* (Atacames) are said to have been conquered by the *Caras;* but they do not appear to have differed materially from other tribes on this part of the Pacific coast.

The remains of Ynca edifices in the Quitu region are all in the latest and most perfect of the architectural styles, which confirms the correctness of the statements received by early writers respecting the conquest of Quitu by the last two Yncas. These edifices have been described in detail by Ulloa and Humboldt.

The language spoken at Quitu, at the time of the Spanish conquest, is said to have been identical with that of the Yncas, and it is the same now, with slight differences in pronunciation and in the vocabulary. The fact is puzzling, seeing that the Chincha-suyu tribes, with a different vocabulary and some variations in grammar, intervene between the Ynca and Quitu regions. Yet the Ynca conquest was so recent that there had been no time to change the language of the subjugated people. It seems to me to be clearly impossible that the Ynca and Quitu languages can really have been identical. The explanation probably is, that there were many Ynca *mitimaes*, or colonists, in the kingdom of Quitu, and that the chiefs and leading men, with whom the Spaniards came in contact, had been educated at Cuzco. The descendants of the *mitimaes* have caused the Ynca language to predominate in modern times; but the existence of aboriginal languages is indicated by the statement of Velasco, in his letter to Hervas.

It would be very interesting to discover whether the workers in gold and gems on the coast were of the same race, and spoke the same language with the natives of the Quitu highlands, or whether they were allied to the civilized people on the coast of Peru, further south. A closer investigation of the *middings* near Chanduy, and of similar remains along that shore, would also yield valuable results.

* Cieza de Leon, cap. 46.

V.—The Yunca Region.

The numerous valleys on the Peruvian coast, separated by sandy deserts of varying width, only required careful irrigation to render them capable of sustaining a large population. In these valleys we meet with a race of people who had made considerable advances in civilization, but who were quite distinct from the people of the Andes. Yunca is an Ynca word, meaning a warm valley. It was applied by the conquering mountaineers to the people of the coast, and, as the word used by themselves is lost, we can do no better than adopt the term applied to them by the Yncas.

There are some slight traces of the Peruvian coast having been originally peopled by a diminutive race of fishermen, who were driven out by the more civilized Yuncas. We are told by Cieza de Leon that, in the valley of Chincha, a very small aboriginal race disappeared before the conquering Chinchas, and that their bones had been seen in certain tombs by the grandfathers of his informants. It is possible that these may be the same people who are described by Bollaert on the coast further south. He calls them *Changos*, and he and D'Orbigny describe them as a gentle, hospitable race of fishermen, never exceeding 5 feet in height, with flat noses, fishing in boats of inflated sealskins, and sleeping pell-mell in sealskin huts, on heaps of dry seaweed. Bollaert, whose account of the *Changos* is better than that given by D'Orbigny, says that they buried their dead lengthwise;* and some bodies have been found in this unusual posture near Cañete. This is another slight link connecting the *Changos* with the early aboriginal race further north. The fishermen at *Sechura*, on the borders of the great northern desert, may be another remnant of this aboriginal race, as well as the *Etenes, Morrópes, Catacáos*, and *Colanes*, described by Mr. Spruce. The 40 words of the Sechura language, collected by Mr. Spruce, prove it to have been entirely different from the language of the Yuncas.†

The coast people, who were in possession of the richest valleys at the time of the Ynca conquest, were an extremely interesting race. They appear to have formed distinct communities in the different valleys, each under a chief more or less independent; but wars were frequent and very bloody. The most civilized and powerful was the Chimu,‡ who ruled over the five valleys of Parmunca, Huallmi, Santa, Huanapu, and Chimu

* Bollaert, p. 172.

† See *note* to my Introduction to Cieza de Leon, p. xliii.

‡ Cieza de Leon, cap. 68; Balboa, pp. 72, 76; Calancha, lib. ii. cap. 35; G. de la Vega, I. lib. vi. cap. 32; Feijoo, 'Rel. de Truxillo,' p. 25.

itself, where the city of Truxillo now stands. The subjects of this prince had made great advances in civilization, and his vast palaces, near the sea-shore, now form most extensive ruins. They cover three-quarters of a league of ground, exclusive of the great squares, 270 yards long by 160 wide, which were used as gardens and cornfields. Each palace is surrounded by an exterior wall of *adobes*, or enormous sun-dried bricks, 50 feet high, 5 yards broad at the bottom, and narrowing to 1 yard at the top. Besides the palaces with their numerous chambers, the enclosures contained huge mounds, with interior passages, used as tombs for the dead, and a reservoir supplied by subterranean aqueducts. Some 9 or 10 leagues from these palaces of the Chimu there is a solid mass of cut stone, 360 feet by 530, and 150 feet high, which was used as a cemetery. It contained chambers of hewn stone, with niches a yard square, containing the bodies in a sitting posture.* The dry climate favoured the adornment of outer walls by colour, and those of the Chimu palaces were covered with very tasteful sculptured patterns. Among other ancient buildings, in the coast valleys, may be mentioned the great fortress at Calaveras in the valley of Casma, and that in the Parmunca valley; the mounds in the valley of the Rimac; the temple of Pachacamac with its vast and now silent city; and innumerable abandoned towns and villages on the rocky hillsides which border almost all the valleys.

Figures of coloured birds and animals are said to have been painted on the walls of temples and palaces, and the remains of this colour are still visible at Parmunca,† and on the sea face of the Pachacamac temple. The inhabitants of the valleys set apart every square foot of ground that could be reached by water, for cultivation, and built their dwellings on the hillsides overlooking their fields and gardens. Their system of irrigation was as perfect as any that modern science has since adopted; and they not only supplied the fields by regular turns regulated by time, but raised the water to irrigate high levels. Cieza de Leon tells us that sometimes, when he had stopped for the night on the banks of one of these irrigating channels, before his people had finished pitching the tent, the channel became dry, the water having been drawn off in another direction. In the valley of Nasca many rich vineyards and cotton estates owe their existence to a most perfect system of irrigation constructed by the ancient people. The Yncas may have improved these irrigation works, and no doubt kept them in good working order; but it is certain that they were originally designed, and

* 'Merc. Per.,' No. 247, p. 38; 'Antiq. Per.'
† Proctor's 'Travels,' p. 175; Cieza de Leon, p. 248; Paz Soldan.

executed by the Yuncas, for the simple reason that they could not have existed without them.

The Yuncas had also made considerable advances in the arts. Silver and gold ornaments, mantles embroidered with gold and silver bezants, robes of feathers, cotton cloths of fine texture, and vases of an infinite variety of design are found in the tombs. Cieza de Leon tells us that the chief of each valley had a great house, with *adobe* pillars and doorways hung with matting, built on extensive terraces. He says that the chiefs dressed in cotton shirts and long mantles, and were fond of drinking-bouts, dancing and singing; and the walls of the palaces were painted with bright coloured patterns and figures. Such places, rising out of the groves of fruit trees, with the Andes on one side and the ocean on the other as background, must have been suitable abodes of joy and feasting.

It is not possible to get any correct notion of the religious creed of these Yuncas. All we know is that there was a far-famed and very sacred temple at Pachacamac, and another in the valley of the Rimac; and that a she-fox, a sea monster, and other idols are said to have been worshipped. As regards divination, the savage old iconoclast Arriaga boasts of having punished 63 wizards in the coast valleys. The rich were buried in the great mounds, called *huacas* by the Yncas, and the rest of the population in the rocky hills or in the deserts; the extreme dryness of the atmosphere accounting for the vast number of well-preserved mummies that are found in cemeteries such as those near Arica.

The Ynca conquest obliterated the Yunca names and traditions, even before the arrival of the Spaniards; so that we can now learn but very little respecting this interesting people. The very name Yunca belongs to the Ynca language, as well as most of the names of places, such as Nasca, Pisco, Runahuanac, Chilca, Pachacamac, and Rimac. In each valley there was a very desperate resistance to the invaders, great slaughter, and a consequent large importation of *mitimaes*, or colonists. It is also recorded that the people of Nasca, and many in the valley of Chimu, were transported into the interior. The Ynca ruins on the coast, though built of *adobes*, are all clearly of their latest and most perfect architectural style; thus, as in Quitu, furnishing a proof of the correctness of Garcilasso's narrative. The best preserved Ynca edifice, of which I took measurements, is at Hervay.

No dictionary of the Yunca language has been preserved; but we have a grammar and a short list of words of the language spoken in the valley of Chimu, and the Lord's Prayer in the *Mochica*, a dialect spoken in the valleys of Runahuanac and

Huarco (Cañete) further south. These fragments prove that the coast people were wholly unconnected with the Yncas and other mountaineers, and of a different origin. The languages are entirely distinct, both as regards vocabulary and grammatical construction.

The Yunca grammar is by Don Fernando de la Carrera, a great-grandson of Pedro Gonzalez, one of the first conquerors, who settled at Truxillo, near the ruins of the Chimu palaces. Carrera was born there, he sucked in the language with his mother's milk, and published the grammar at Lima in 1644; but he declares that the Yunca is so very difficult that he was the only Spaniard who had ever been able to learn it. In his time it was spoken in the valleys of Chimu, Chicama, Chocope, Sana, Lambayeque, Chiclayo, Huacabamba, Olmos, and Motupe. When the 'Mercurio Peruano' was published in 1793, it is said to have entirely disappeared. The Yunca has three different declensions of nouns, the Ynca language only one. The Yunca has no transitive verbs, and no exclusive and inclusive plurals, which are the chief characteristics of the Ynca language. On the other hand the Yunca conjugations are formed in quite a different way from those in the Ynca language. Carrera gives the Yunca numerals, which are very complete; and a list of words for parts of the body.* Of the *Mochica* language, which

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* Carrera's Yunca grammar is so very scarce that I here give a few specimens :—

FIRST DECLENSION.

Mecherrœc	A woman.
Mecherrcœro ..	Of a woman.
Mecherrcœropœn ..	To a woman.
Mecherrœcœn ..	Women.
Mecherrœcœnro ..	Of women.

SECOND DECLENSION.

Eng	A mother.
Engeio	Of a mother.
Engeiopœn	To a mother.
Engœn	Mothers.

THIRD DECLENSION.

Cholu	A boy.
Cholungo	Of a boy.
Cholungopœn ..	To a boy.
Cholucen	Boys.

ADJECTIVE.

Peño nopœn	A good man.
Peño mecherrœc ..	A good woman.
Peño nepœc	A good tree.
Utzho ong	A large algoroba.

PRONOUN.

Moiñ	I.
Mœino	Of me.
Mœich	Us.
Tzhang	You.

AUXILIARY VERB.

Moiñ e *or* ang ..	I am.
Tzhang e	You are.
Aio e	He is.
Mœich e	We are.
Aiong œre	They are.

VERB.

Meteiñ	I bring.
Metaz	You bring.
Metang	He brings,
Meteix	We bring.
Metazchi	Ye bring.
Metœnang	They bring.
Meteiñ piñ	I brought.
Metaz piñ	You brought.
Metang piñ	He brought.

was spoken in the country south of Chimu, especially in the valleys of Huarco (Cañete) and Runahuanac (Lunahuana), we only have the Lord's Prayer, which has been preserved by Bishop Orè. It is impossible to form a decided opinion from one specimen, but it seems to be a mere dialect of Carrera's Yunca language.

The difference of language proves that the Yuncas of the coast did not, like their conquerors the Yncas, descend into the warm valleys from the region of the Andes. There are reasons, already stated, for thinking that they were not the aboriginal inhabitants of the coast. Two alternatives remain. They either came from the north, and were offshoots of the Huancavilcas and Mantas, the gold workers and lapidaries of the Quitu seaboard; or they arrived from beyond seas. We can form no opinion on the former possibility without a comparison with the languages of the northern tribes. There remains the other suggestion, that the Yuncas arrived by way of the Pacific ocean. On this point we have few reliable data. Acosta * tells us that the Indians of Yca and Arica relate how, in ancient times, they used to make voyages to islands in the far west, on the inflated skins of seals. But the story, I suspect, really only refers to the trips of the thrifty coast agriculturists to the Chincha Islands, for manure. Balboa,† however, an older and more reliable authority, gives a detailed account of the statements made at the time of the conquest by the coast Indians of Lambayeque. They declared that a great fleet arrived on the

Meteiñ met .. .. I will bring.
Metaz met .. .. You will bring.
Metang met .. .. He will bring.

NUMERALS.

1. Oncœc.
2. Atpat.
3. Copœc.
4. Nopœc.
5. Exll mœtzh.
6. Tzaxil.
7. Nite.
8. Lang œss.
9. Tap.
10. Ciœch (seldom used). Napong (men), Nassop (things).
11. Napong allo oncœc.
12. Napong allo aput.
13. Napong allo copœt.
20. Pac pong.
30. Çoc pong.
40. Noc pong.
100. Na palœc.
1000. Na cuño.

Allo is a copulative conjunction.

Neizna	Morning.
Hac	Hair.
Falpœng	Head.
Loch	Eyes.
Medeng	Ears.
Fon	Nose.
Sap	Mouth.
Echang	Teeth.
Ed	Tongue.
Çengque	Neck.
Ocœn	Arm.
Mœcha	Hand.
Ssod	Bosom.
Pilla	Thigh.
Tonia	Leg.
Nosscœn	Knee.
Loc	Foot.

* Lib. i. cap. 19, p. 68.

† 'Hist. del Peru,' p. 89 (T. Campans' ed.).

coast, some generations earlier, commanded by a chief named Noymlap, who had with him a green stone idol, and that he founded a dynasty of chiefs.

South of Nasca, the Peruvian coast appears to have been uninhabited, except by scattered families of Chango fishermen, until the Yncas established colonies of *mitimaes* in the valleys of Arequipa, Moquegua, Tacna, and Arica. Those of Arequipa are said to have been brought from Cavanilla, those of Tacna from Juli and Pisacoma, and those of Moquegua from Acora and Ylave—all villages in the Collao.

We thus have the following tribes along the Peruvian coast, beginning from the north:—The *Colanes;* the *Etenes;* the *Catacáos;* the *Sechuras;* the *Morrópes;* the *Chimus* (the *Yuncas* of Carrera); the *Mochicas* (the *Chinchas* of Garcilasso); and the *Changos.* The coast Indians have almost entirely disappeared. Their languages are disappearing; the most important have ceased to be spoken. But their civilization is attested by several old writers, and is illustrated by ruins, and by many works of art. They are the most mysterious as regards their origin, and in that respect the most interesting of all the tribes in the five great regions we have now passed in review.

This completes our survey of the tribes which formed the empire of the Yncas. It will be seen that they resolve themselves into two primary divisions, distinguished by a complete difference of language, both as regards vocabulary and grammatical construction; sufficient to establish an entirely separate origin. These are the people of the four Andean regions, and the Yuncas of the coast. They form two civilizations and two races. The tribes of the four Andean regions, on the other hand, spoke languages which, though differing as regards vocabulary, are identical in grammatical construction, and point to a common origin.

The languages are our most reliable guide. Physical differences are caused by local circumstances, and all travellers in Peru must have observed many shades of colour in the skins of the Indians, and great variations in their physical development; but these phenomena are attributable to climatic influences and to varied habits of life. The languages, however, when carefully studied, give us an insight into the original condition of the different tribes, and, with the aid of evidence collected from the earliest writers, enable us to resolve the great Ynca empire into its elements, and to classify its component parts. The present attempt towards such geographical classification is, in a great measure, provisional; but, by carefully avoiding all groundless assumptions, and by adhering to

the canons of criticism which have been adopted after consulting high authorities on such matters, I trust that the present paper will at least prove to be a step in the right direction.

APPENDIX ON THE NAME AYMARA.

THE name *Aymara* has been generally but erroneously applied to the people inhabiting the basin of the Lake Titicaca, a region which is known as the Collao. The name really belongs to an *ayllu* or lineage of the Quichua tribe, inhabiting quite a different part of Peru, and wholly unconnected with the people of the Collao. The improper application of the name has caused much confusion, and has led several eminent and learned men into serious errors. It, therefore, seems very desirable that the question should be thoroughly investigated.

It is asserted, in support of the theory that *Aymara* was the name of the people of the Collao:—First, that the name in question was borne by the people of the Titicaca basin before the existence of the empire of the Yncas; and in proof of this a reference is given to the 10th chapter of the 3rd book of the 'Royal Commentaries of Peru,' by Garcilasso de la Vega. A perusal of this 10th chapter will show that Garcilasso neither states nor implies anything of the kind.

The second reason alleged for thinking that the word Colla (the name by which the people of the Titicaca basin were known to the Yncas and early Spaniards) is more recent than that of Aymara, is, because the Aymaras are asserted to have been subjugated by the Yncas before they annexed the country of the Collao.

Garcilasso, an author who describes the progress of the Ynca conquests in detail, tells us the exact opposite: namely that the Collao were conquered by the third and fourth Yncas,* while the Aymaras were subdued afterwards by the fifth Ynca.† At the same time it is not clear why the date of the conquest of these tribes should be thought to have anything to do with the relative antiquity of their names, nor why their antiquity should have any bearing on their correct application.

The third assertion is that the Aymara tribe, mentioned by Garcilasso, lived in the Collao before the Spanish conquest.

I shall presently show, by a connected chain of evidence, that the geographical position of the Indians of the Aymara tribe has been misunderstood; and that their homes were several hundred miles from the nearest point of the Collao.

Finally, the antiquity of the so-called *Aymara* name and nation may, it is alleged, be estimated by the allusion to its annexation by the third and fourth Yncas, in Garcilasso.

1. The word *Aymara* is never so much as mentioned in Garcilasso's account of the campaigns of the third and fourth Yncas, who vanquished the Collas, not the Aymaras.

I will now explain my view of the case, as regards this name *Aymara*.

2. It is of course well known that for the last three centuries the language of the people inhabiting the basin of Lake Titicaca has been called *Aymara*, and that, for about 200 years, the term has been extended to the people who speak it, and who are now called *Aymara* Indians, though their country is known as the Collao. But in the course of my study of the early Spanish

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* G. de la Vega, I. lib. ii. caps. 18, 19, 20; lib. iii. caps. 1 to 8.

† Ibid., I. lib. iii. cap. 10.

writers on Peru, I was struck by the total absence of the word Aymara from their pages, although the people themselves, under the name of Collas, are constantly mentioned, and sometimes particularly described. On closer investigation, I found that not a single writer contemporary with the Spanish conquest, who describes the people of the Collao, ever mentions the word Aymara. I am acquainted with the writings of seven authors contemporaneous with the Spanish conquest, who mention the Collao; five of whom had been in the country, while the other two were historians who compiled from original sources.

3. *Francisco de Xeres* (1547), the secretary of Pizarro, who published his book in the above year, alludes to the Collao, but never mentions the word Aymara.

4. *Polo de Ondegardo* (1550) was an enlightened statesman, and was at one time governor of Charcas. He made a close official enquiry into the laws and usages of the Indians, including the people of the Collao. Nothing seemed to escape him, and he enters into minute detail, but the name Aymara never appears in his manuscript.

5. *Gomara* (1553) was a compiler and was never in Peru, but he lived at Seville, and had access to numerous original documents. His history was published in the above-mentioned period, and in it he mentions the Collao, but the word Aymara is absent from his pages.

6. *Cieza de Leon* (1554), the gallant soldier and graphic narrator, who is always careful to give the name of every tribe he encountered, and who devotes two chapters to an account of the Collas, never mentions the word Aymara. The 'Crónica del Peru' of Cieza de Leon is a voluminous work, and one of the best that was written at the time of the conquest. It is in four parts; the first, which is the only one in print, consisting of 570 closely printed duodecimo pages. He is very careful to give the names of the tribes he came in contact with, and if the people of the Collao had been called Aymaras, he would assuredly have given them the name. But their name was Colla, and he calls them so accordingly.

7. *Zarate* (1555), the financier, was a writer who knew the country. He speaks of the Collas, but never of the Aymaras.

8. *Levinus Apollonius* (1567) was a compiler who published his work on Peru at Antwerp in the above year. He wrote in Latin, and invariably called the people of the Titicaca basin "Collaoes," and their country "Regio Collaonibus." The word Aymara does not occur in his book.

9. *Fernandez el Palentino* (1571), the chronicler of Peru, has frequent occasion to mention the Collao, in his narrative of the wars of Gonzalo Pizarro and Giron, but he never once mentions the word Aymara.

10. According to D'Orbigny and others who advocate the "Aymara" theory, there was a nation called *Aymara*, whose name was older than the time of the Yncas, and who inhabited the whole extent of the basin of Lake Titicaca, from 15° to 20° s. lat. Yet all the writers, without a single exception, who visited that region at the time of the Spanish conquest, and who wrote an account of its inhabitants, concur in calling it by another name, and not one so much as mentions the word Aymara. If it was the name of the nation they must have known it, and would have said so. Their silence proves that the name was then unknown in the Collao, as that of the people to whom it is now incorrectly applied, and who were then called Lupacas, Collas, Pacasas, &c.

11. We next come to the authors who wrote upon Peru in the generation after the Spanish conquest. We have seen that the name Aymara was not applied to the people of the Collao at the time of the conquest, and we shall now find that it was equally foreign to them in the succeeding generation. Of these I will mention seven (besides the Jesuit grammarians to be dealt

with separately), namely, Balboa, Acosta, Herrera, Garcilasso de la Vega, Ramos, Montesinos, and Calancha; all of whom knew the country personally, except Herrera.

12. *Miguel Cavello Balboa* finished his history of Peru in 1586. He mentions the conquest of the Collao by the Yncas, and says that the name of their king was Colla.* He calls the country Collao, and its inhabitants Collas, and never once mentions the word Aymara.

Acosta (1590), the Jesuit, completed his work in the same period, and has much to say respecting the Collao and the Collas; but he never mentions the word Aymara.

Herrera (1601), the great historian of the Indies, who had full access to all official documents, published his work in 1601-15. He invariably calls the region of Lake Titicaca, Collao; and, though he uses the word Aymara, it is only to furnish a direct proof that it was not the name of the people of the Collao.†

Garcilasso de la Vega (1609), whose 'Royal Commentaries' form by far the most valuable book on ancient Peru, invariably calls the people of the Titicaca basin Collas; and his mention of the Aymaras supplies a further proof that they had no connection whatever with the Indians who now incorrectly bear that name.‡

Alonzo Ramos (1620), a Jesuit, wrote his history of Copacabana in 1620, and his mention of Aymaras and Collas proves, as will presently be explained, that the former were strangers, and the latter natives of the Collao.§

Fernando Montesinos, the licentiate, passed many years in Peru, and wrote his historical memorials in about 1652. He always calls the country of the Titicaca basin the Collao, and never mentions the word Aymara.

Calancha (1653) was born and died in Peru. In his history of the proceedings of the Augustine Fathers in that country, which was published in the above year, the proof is completed that the Aymaras were a tribe wholly unconnected with the Titicaca region.‖

13. These proofs that the word Aymara was not the name of the Indians of the Collao at the time of the conquest, though I believe quite conclusive, are negative. I will now produce positive proofs that the Aymaras, at the time of the conquest and previously, formed a tribe entirely unconnected with the Collao, speaking a different language, and living in a distant part of Peru.

14. Garcilasso de la Vega is the only author who describes the progress of the successive Ynca conquests in any detail. According to him the third and fourth Yncas conquered the whole region of the Collao, as far south as the Lake of Paria. The fifth Ynca, named Ccapac Yupanqui, therefore turned his attention to the region to the westward of Cuzco, called by the Yncas Cunti-suyu. By following the course taken by this fifth Ynca, and his general Auqui Titu, in two successive campaigns, we shall discover whence the name Aymara really comes, and how foreign it is to the language and people of the Collao. Garcilasso's detailed narrative of these campaigns is supported, to some extent, by Herrera.¶

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* Ternaux ed., pp. 55, 87, 151, 182.

† See paragraph 20.

‡ See paragraphs 16, 17, 19.

§ See paragraph 32. The word occurs twice in Ramos, once in the list of colonists at Copacabana, and once where he says that *Titi* means a wild cat in *Aimara*, caps. 6 and 7.

‖ See paragraph 21. The word occurs four times in the work of Calancha, twice in mentioning the real province, at pp. 724 and 855, once in mentioning the colonists at Copacabana, p. 6 (ii.), and only once as the language in the south, p. 860.

¶ Herrera, Dec. V. cap. 3. Fernandez, II. lib. ii. cap. 41.

15. The Collao is bounded on the west and east by two lofty chains of mountains, which are united by a saddle to the north, forming the water-parting between the drainage of Lake Titicaca and that of the great river Apurimac. On the northern slope of this saddle are the sources of the Apurimac and its affluents, and the region which these streams water is the Cunti-suyu of the Yncas. The Apurimac itself sweeps round and bounds Cunti-suyu on the east and north. This region was inhabited by the Quichua nation; which was divided into six tribes called Cotapampas, Cotaneras, Yanahuaras, Chumpivilcas, Aymaras, and Umasayus.

16. The Ynca Ccapac Yupanqui, having crossed the River Apurimac at the holy bridge (*Huaca-chaca*), found himself in the country of the Yanahuaras, and came to a town in it called Piti. All these names can easily be identified. The Huaca-chaca still spans the Apumirac; Yanahuara is in the modern province of Cotabambas, and Piti is a town in the same province. From Yanahuara the Ynca advanced to the territory of another tribe called Aymaras, whose fighting men he found encamped on a hill called Mucansa. Eventually they submitted, and the Ynca encamped at a place in the Aymara country called Huaquirca.* These names can also be identified. The Aymaras are the people of the modern province of Aymaraes, on the upper waters of the Pachachaca or Abancay. The Cerro de Mucansa is on the border between Cotabambas and Aymaraes. Huaquirca is a town in Aymaraes. The Ynca then settled some pasturage disputes between the Aymaras and their neighbours the Uma-sayus. This Uma-sayu† (which has been confused with the Omasuyos on the east side of Titicaca) was a district on the western frontier of the Aymaras. It can be identified by the towns of Totora and Chiriqui, which Calancha and Pinelo tell us were in this Uma-sayu, and which still exist.‡

17. In the second campaign the Ynca general, named Auqui Titu, again crossed the Apurimac at Huaca-chaca, traversed the province of Cotapampa (the modern Cotabambas), and entered that of Cotaneras, who declared that they desired to be vassals of the Ynca, to escape from the tyranny of their powerful neighbours the Chancas.§ The Ynca general then marched onwards, reducing the country on either side of the River Abancay, which was also inhabited by the Quichuas. Garcilasso mentions that one of the branches of the Abancay flows past the town of Chuquinca. We thus learn that the tribe of Aymaras inhabited the upper part of the valley of the River Abancay or Pachachaca; that the Cotaneras dwelt on the high pasture land between that valley and Cotabambas, as well as in part of the valley lower down; and that the Chancas, the powerful enemies of both these neighbour tribes, were established in the lower valleys of Andahuaylas and Abancay.

18. It has been necessary to enter into these geographical details, because they have been totally misunderstood. It has been assumed that Uma-sayu is the Omasuyos to the east of Lake Titicaca, and that if the Aymaras bordered on it, they must have lived in the Collao. In reality there were two Uma-suyus. This one, in the western division of the Ynca empire, was after-

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* G. de la Vega, lib. iii. cap. 11.

† In the first edition of Garcilasso (1609) it is Umas*a*yu; in the second edition of 1723 it is printed Umasuyu. See also a letter of Juan de Padilla ('Papeles Varios').

‡ Calancha, iii. cap. 12, p. 855. The districts of Cotabambas and Umasayu were united under one Corrigimiento (see Letter of Juan de Padilla, 1660, 'Papeles Varios'). In this "Corrigimiento de Cotabambas y Umasayu," the Augustin friars held the *doctrinas* of San Agustin de Cotabambas, Chiriqui y Chuquibamba, Mamara y Turupai, Totora y Oropesa, and San Juan de Totora.

§ G. de la Vega, iii. cap. 12.

wards included in the Spanish 'Corrigimiento de Cotabambas y Umasuyu.'* The direction of the Ynca's march, his crossing the Apurimac at Huaca-chaca, and the mention of Cotabambas, the Cerro de Mucansa, the towns of Piti, Huaquirca, Chuquinca, Totora, and Chiriqui, and the River Abancay, furnish data to fix the exact position of the Aymara country.

19. When the Chancas rebelled and were marching in great force against the Ynca Uira-ccocha, Garcilasso says, "20,000 men of war came to his aid from the parts of Cunti-suyu, about 20 leagues away, being people of the Quechua nation, belonging to the Cotapampa, Cotanera, Aymara, and other tribes who bordered on the territory of the rebels in that direction." †

20. There is further evidence of the exact position of the Aymara nation. Herrera ‡ tells us that when Hernando Pizarro marched from the coast to attack Almagro at Cuzco, he started from Nasca, ascended the mountains to Parinacochas, and then crossed an uninhabited region to the province of the Aymaras, thence going by Totora and the Chumpivilcas province to the Apurimac. Totora is still a village in the province of Aymaraes. The rebel Giron also, in 1552, started from Nasca, crossed the Cordilleras to the province of the Aymaras, and defeated the Marshal Alvarado at Chuquinca on the Abancay. He then marched down the valley of the Abancay, to burn the villages of the neighbouring Chancas, who had assisted his enemies. We are told all this, in much detail, by Fernandez of Palencia.§

21. Father Calancha, in his history of the Augustine Order in Peru, also distinctly fixes the position of the country of the Aymaras; and of their neighbours the Uma-sayus.‖ He says that the Augustines were sent to convert the Uma-sayus together with the Cotapampas, showing that they bordered on the province of Cotabambas. He goes on to tell us that the land of the Aymaras is about 30 leagues W.N.W. of Cuzco, a mountainous country with pleasant ravines, fertile plains, and very lofty peaks. Its towns, he adds, were Huaquirca, Sobayno, Antabamba, and Calcauso. All these places are in the modern province of Aymaraes, some 70 or 80 miles west of Cuzco.

22. The foregoing chain of evidence must, I submit, be accepted as placing the true position of the ancient Aymaras beyond a doubt; and as proving that the ancient province of Aymaras and the modern province of Aymaraes are identical. The Aymaras were a small tribe of the Quichua nation, living in a remote part of the valley of the Abancay; with the Uma-sayus, Cotapampas, and Cotaneras as their neighbours. They had not the slightest connection with the people of the Collao, but were Quichuas of the Quichuas, specially loyal vassals of the Yncas,¶ and speaking the so-called Quichua language, which their descendants still speak.

23. After the blunder of calling the people of the Collao by the name of Aymaras had been established by long use, people were evidently puzzled by the existence of these *true* Aymaras in a part of Peru so far distant from the Collao. D'Orbigny** quotes a census made in 1795, in which the difficulty is got over by classing the Quichua-speaking *true* Aymaras with the so-called Aymaras of the Collao. But this arbitrary and false classification explains nothing. It has been assumed that the province of Aymaraes was the most northern limit of the nation of the Collao; and so an attempt

* Carta de Juan de Padilla.

† G. de la Vega, v. cap. 17. "Quechuas de los apellidos Cotapampa y Cotanera," lib. v. ch. 23.

‡ Herrera Dec. VI. lib. iv. cap. 4.

§ Fernandez, 'Hist. del Peru,' Part II. lib. ii. caps. 44, 45, 50.

‖ Calancha, iii. cap. 37, p. 724; iv. cap. 12, p. 855.

¶ G. de la Vega, v. cap. 17; Ramos, cap. 7.

** 'L'Homme Américain,' i. p. 310.

is made to get over the difficulty. But, in addition to there not being a particle of admissible evidence for such an assumption, the thing is evidently impossible. The nearest point of the Collao is 150 miles from Aymaraes, and upwards of 200 by the only practicable road—that taken by the Marshal Alvarado in his march against the rebel Giron. The intervening space was peopled by tribes who were hostile to the Collas, and did not speak their language. First there were the Canas, with whom the Collas waged fierce and unsuccessful wars before the Ynca conquest.* Then a lofty tract of uninhabited mountainous country would have to be traversed. Then the river Apurimac must be crossed. Then the Chumpivilca, Yanahuara, Cotapampa, Uma-sayu, and Cotanera tribes must be encountered and overcome. All these obstacles would have to be got over, before the people from the Collao could reach the province of the Aymaras, and turn it into their northern frontier. It is scarcely necessary to add that there is no record of any such achievement having been attempted.

24. It has now been established that the people of the Collao were not called Aymaras at or before the Spanish conquest, that the real Aymaras were a small Quichua tribe living in a part of Peru remote from the Collao, and that therefore the word is foreign to the language which is now incorrectly called Aymara. It remains to inquire by what chance a name so inappropriate was originally applied to the people and language of the Collao.

25. It appears that the first time that the word Aymara was ever applied to the language of the Collao was by the Jesuits, who were established at a village near the western shore of Lake Titicaca, called Juli, in about 1570. They had a college and four parishes there, and studied the languages of the Indians.† But it so happened that there were descendants of colonists from all parts of Peru settled at Juli,‡ the most numerous of whom were some Aymaras;§ and the language they spoke, though based on that of the Collao, was very corrupt. The Jesuits gave the name of Aymara to the language they learnt at Juli, and finding that they were understood by other Indians in the basin of Lake Titicaca, they extended the name to the language and people of the Collao. It was generally received as the name of the language by other writers, for want of a better, but not as that of the people.

26. Among the first Jesuits established at Juli, were the writers Gonzalo Holguin, Diego de Alcobaça, and probably Blas Valera.‖ The first instance I have met with, of the name Aymara being applied to a language of the Collao, is in the 'Ordenanzas' of the Viceroy Don Francisco de Toledo, who appointed Gonzalo Holguin, a person expert in three languages spoken by the Indians (called Quichua, Puquina, and Aymara) to be his Interpreter-General, on a salary of 500 dollars a year; the order is dated at Arequipa, September 10th, 1575.¶

27. Diego de Alcobaça, another of the first Jesuit Fathers settled at Juli, was a half-caste native of Cuzco, and was brought up with the Ynca Garcilasso de la Vega, author of the 'Royal Commentaries.' The two boys went to school together at Cuzco, to the house of the good old canon Juan de Cuellar, who taught about eighteen half-caste lads a little grammar, and to read Latin. When they grew up, Garcilasso went to Spain in 1550, while his schoolfellow became a Jesuit missionary in his native country. The two friends kept up a correspondence. In 1603 Alcobaça sent the Ynca Garcilasso a 'Confesionario,' which he had printed at Lima in 1585, in three languages —"Spanish, the general language of Cuzco, and the special one of the province

* Cieza de Leon, cap. 100.
† Arriaga. 'Extirpacion de la idolatria,' cap. 20, p. 123.
‡ Bertonio. § Blas Valera.
‖ Hervas says that Father Blas Valera was "contemporaneo y compañero de Bertonio," i. p. 244. ¶ Titulo, xv. p. 84.

called Aymara."* Alcobaça also sent his friend a description of the famous ruins at Tiahuanacu,† and supplied him with news respecting what had passed in Peru and Chili since his departure.‡ Thus Garcilasso gives us the following bit of news about the Jesuits;—"A Father of the Company of Jesuits composed a play, in honour of our Lady the Virgin Mary. It was written in the Aymara language, which was different from the general language of Peru. . . . . The actors were Indian lads, and the ceremony took place in a village called Sulli." § It is odd that Garcilasso does not make a digression here to explain how it was that a language spoken at Sulli (Juli), on the shores of Lake Titicaca, had the same name as a tribe living hundreds of miles away, whose subjugation and subsequent exploits he himself records. It seems never to have occurred to him that the Jesuits had given this name to a language of the Collao, for he speaks of the name as applied to the language "of the province called Aymara," the province which he had himself described as being to the westward of Cuzco, and not in the Collao. The mention of a village called *Sulli* might not identify the locality in his mind, for on the only occasion that he mentions Juli he spells it quite differently—*Chulli*.‖

28. The way in which the name Aymara got misapplied by the Jesuits at Juli is, however, not far to seek. We are told by Father Alonzo Ramos, the historian of Copacabana, that when the Ynca Ccapac Yupanqui conceived a strong veneration for that sacred locality, he removed the whole of the Colla natives to the neighbouring village of Yunguyo, and supplied their places by *mitimaes*, or colonists, from the most distant provinces of the empire.¶ Ramos enumerates 43 tribes from which colonists were drawn, including Yncas, Canas, Aymaras, Chumpivilcas, Yanahuaras, and Chancas. Among the most numerous, according to Blas Valera,** and Calancha,†† were the Aymaras. The descendants of these colonists spread themselves from the peninsula of Copacabana to the mainland, and settled in the village of Juli. Indeed, Blas Valera asserts that, in his time, all the inhabitants of Sulli (Juli) were Aymaras.‡‡ This is an exaggeration, for Bertonio mentions people belonging to the Chinchaysuyus, Canas, and three other tribes, who were then living at Juli.§§ We may, assume, however, that the descendants of Aymara colonists formed a large proportion of the population at Juli in those days.

29. During a residence of upwards of a century in the Collao, and especially during the generation after the Spanish conquest when intermarriages with native women would be frequent, the descendants of these Aymara colonists, while retaining the name of their ancestral *ayllu*, or tribe, gradually and insensibly adopted the language of the Collao people in whose midst they lived, though retaining many words of their mother tongue.‖‖ Now, it has been seen that Juli was the very place where the Jesuits, and among them Holguin

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* G. de la Vega, Part II. lib. i. cap. 23. See also von Tschudi, 'Kechua-Sprache,' p. 26.

† G. de la Vega, Part I. lib. iii. cap. 1; Part II. lib. iv. cap. 10.

‡ G. de la Vega, Part I. lib. vii. cap. 25. § Part I. lib. ii. cap. 28.

‖ Part I. lib. ii. cap. 20. In edition of 1609, as well as that of 1723. Cieza de Leon spells it *Xuli*, cap. 104.

¶ Ramos, cap. 7; Herrera, Dec. V. lib. iii. p. 74.

** Lib. ii. cap. 9. †† II. lib. i. p. 6.

‡‡ Blas Valera's torn MSS.; passage copied by Garcilasso in his 'Commentaries,' Part I. lib. vii. cap. 4.

§§ Hananusuyus, Hurinsuyus, Chinchaysuys, Canasu, and Hoyancas.

‖‖ This was especially the case with the Chinchaysuyus. Bertonio, 'Preface:'—"Many use different words for the same thing, even in this town of Juli, where the Hanasuyus differ from the Hurinsuyus and Hayancas; and the Chinchaysuyus, born here, speak somewhat differently from the others."

and Alcobaça, were established. They learnt the Collao language, in a very corrupt form, from the descendants of colonists who had been brought from the distant Quichua province of Aymara;* and they very inappropriately, but not altogether unnaturally, gave it the name of the Aymara colonists, from whose descendants they had learnt it. This is, I think, the most probable explanation of the blunder. The name Aymara was adopted for the language by the Jesuits at Juli; it found its way into Garcilasso's work † in two quotations from Alcobaça's letters, and even twice occurs in the chronicle of Herrera.‡ The Jesuits, having given the language this name, were not long in applying it to the whole mass of Indians in the Collao who understood the language.

30. The next works, after the appearance of the 'Confesionario' by Alcobaça, in which the language of the Collao is called Aymara, were by Bertonio. The Jesuit Father Ludovico Bertonio, an Italian and native of the marches of Ancona, first came to Peru in 1593, and joined the college at Juli about twenty years after his brethren had adopted the name Aymara for the language of the Collao. Thus he never heard it called by any other name. He studied the corrupt form of it spoken at Juli for twenty years. In 1603, his 'Arte breve de la lengua Aymara' came out at Rome, and a second and much better edition was printed at Juli. His Aymara Vocabulary was finished on July 10th, 1611, and also printed in the Jesuits' house at Juli.§ It fully deserves the name of a dictionary, for it consists of 398 pages, and contains several thousand words; but it has a very large percentage of Quichua words current among the people at Juli, and bears internal evidence of having been compiled from the mouths of those Quichua tribes—among them the Aymaras—who as colonists were settled at Juli. Indeed, Bertonio tells us as much. He says that the different Indians gave him various words for the same thing, so that a word obtained from an Indian may not agree with that for the same thing in his dictionary; and he even thinks it necessary to declare that none of the words were invented out of his own head.‖ There was evidently a sort of Babel at Juli.

31. Diego de Torres Rubio, another Jesuit, published his short grammar and vocabulary of the so-called Aymara language at Lima in 1616. The vocabulary is very meagre, consisting of about 1690 words, of which 20 per cent. are Quichua. This very large preponderance of alien words is, as has been shown, accounted for by the Jesuits having learnt the language from descendants of Aymara and other foreign colonists, instead of from the people of the Collao themselves.

32. Herrera in one instance, Garcilasso in a single quotation, the Viceroy Toledo, and Ramos and Calancha, adopted the Juli Jesuits' name for the language of the Collao; but they all invariably called the people who spoke it Collas, and never Aymaras. For they all knew perfectly well that the Aymaras were a tribe of the Cunti-suyu, speaking the general language,

* Bertonio.

† The word occurs eight times in Garcilasso. At I. lib. ii. cap. 28, mentioning the play acted at Sulli; at lib. iii. cap. 10, twice; cap. 11, and lib. v. cap. 17, relating the deeds of the real Aymaras; and at II. lib. i. cap. 23, twice, mentioning the 'Confesionario' of Alcobaça. The eighth time is in a quotation from Blas Valera, I. lib. vii. cap. 4, where he says the people at Juli were all Aymaras.

‡ "Hablan la lengua general, que se llaman Aimaràn, i tambien de los Ingas, i pocos hablan la particular."—*Herrera*, Dec. VIII. lib. v. cap. 3. But the royal chronicler, who had never been in the Indies, evidently had very vague ideas on the subject of these languages. The name occurs in one other place in Herrera in speaking of the real province, Dec. VI. lib. xiv. cap. 4.

§ Bertonio also translated into Aymara, for the use of the Indians, a life of Christ by the licentiate Alonso de Villegas (Juli, 1612, 4to.).

‖ "Pero ningun vocablo he sacado de mi propria cabeza."—*Bertonio.*

with their homes far to the westward of Cuzco.* Ramos shows that he understood this clearly, for he says that the colonists alone, and among them the Aymaras, were allowed to enter the temple at Copacabana; while the Collas, or natives of the country, being immoral and lascivious, were excluded; and he likened this rule to the Jews excluding the tribes among whom they dwelt from the sanctuary.†

33. But when the name *Aymara* was once generally adopted as that of the language of the Collao by the Jesuits and dominant class, it was an easy transition for inaccurate writers to apply it to the inhabitants of the Collao, who speak that language. Bertonio speaks of the "nacion Aymara" as embracing all the numerous tribes who used the language which he had learnt among the colonists at Juli, in the country of the Lupacas. First, they erroneously called the language *Aymara*, and then they dubbed all the tribes who used it "la nacion Aymara." But the first occasion, so far as my reading goes, on which the name of Aymara was ever applied to Indians in the Collao, by any one beyond the Jesuit brotherhood, was by the Viceroy, Prince of Esquilache, in a long minute drawn up for the information of his successor, and dated January, 1620.‡ Now the term is universal, and an Indian of the Collao would not understand if he was called anything but an Aymara.

34. In conclusion, I will sum up the evidence with respect to this name Aymara in a few words. I have first based my proof that it was not the name of the people of the Collao at or before the time of the Spanish conquest on the fact that not a single contemporaneous writer who describes the Collao and its people even so much as mentions the name. I have strengthened this proof by referring to the additional fact that neither does a single writer, in the generation after the conquest, although several mention the name Aymara, ever apply it to the people of the Collao, except the Jesuits at Juli. I have, then, shown, by a mass of evidence, that the name Aymara belonged to a small Quichua-speaking tribe, who were entirely unconnected with the people now miscalled Aymaras. Finally, I have suggested the probable origin of the blunder among the Fathers at Juli.

35. It must not be supposed that I have originated anything new in observing that the word Aymara was foreign to the people who now bear that name, although the point has not probably been so closely investigated before. It has always been well known to students of South American history and ethnology that both the words Quichua and Aymara were incorrectly adopted for their present use by the Spaniards.§ The Quichua language was always called the general language of Peru, the court language, or the language of the Yncas, by old writers. Father San Tomas, the author of the first grammar, gave it the rather inappropriate name of Quichua, probably because he learnt it amongst the Quichuas of Cunti-suyu, who spoke it. We have seen how the blunder of calling the language of the Collao by the name of Aymara originated.

36. D'Orbigny was aware, as regards the word Quichua, that it was only the name of a tribe, and that it was first applied to the language generally by the Spaniards.‖ He also knew that the word Aymara was at first confined to a province;¶ but his want of personal knowledge of the geography of Central

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* Herrera, Dec. VI. lib. iv. cap. 4; G. de la Vega, Part I. lib. iii. cap. 10, Calancha, lib. iv. cap. 12, p. 855; Ramos, cap. 6.

† Ramos, cap. 13.

‡ The words are, "Orden que los Indias Aymaraez de Chuquito, de Mita, no paguen ni de ellos se cobran mas que lo que cobran de los que quedan en su provincia."—*Memorias de los Vireyes*, i. p. 96.

§ "Se suele por los autores modernos llamar Quichua."—*Herras*, i. p. 231.

‖ 'L'Homme Américain,' i. p. 255. ¶ 'L'Homme Américain,' i. p. 307.

Peru, and his inaccurate quotations from Garcilasso, led him into the erroneous belief that the people of this province spoke the same language and were of the same race as the people of the Collao. This confusion induced him to apply the name Aymara to the people as well as to the language of the Collao. Don Mariano Rivero was evidently aware that the term was merely one that had been adopted by Europeans for convenience; for he says that "*M. D'Orbigny gives* them the name of the Aymaraes." Rivero has adopted D'Orbigny's nomenclature in his 'Antiguedades Peruanas.'* But von Tschudi, in his 'Kechua-Sprache,' invariably calls the people Collas;† and in one place he speaks of the *Colla-Sprache*,‡ though as a rule he adopts the name Aymara for the language, no doubt because it had been so long used in that sense. Lorente, also, the Peruvian historian, uses the conventional term Aymara for the language, but always speaks of the people as Collas.§

37. I will point out one instance, out of many, of the confusion that is caused by the misapplication of the word Aymara, from which students suffer who have not an intimate personal acquaintance with Peruvian topography. Don Lorenzo Hervas was a learned scholar, who, however, had not visited this part of South America. In reading Garcilasso's narrative of the conquests of the 5th Ynca in Cunti-suyu, he came to the account of the subjugation of the Aymara province. He had gathered from the misleading pages of Bertonio that the Aymara language was spoken round the shores of Lake Titicaca; so he naturally came to the conclusion that the Aymara province conquered by the 5th Ynca also bordered on the Titicaca Lake.‖ D'Orbigny, from the same premises, and owing to the same want of knowledge of Peruvian topography, has fallen into the same mistake. Had these distinguished writers known the positions of the places mentioned in connection with the conquest of the Aymara province—namely, of Piti, Cotapampa, Cotanera, Mucansa, Huaquirca, Chiriqui, Totora, and Chuquinca—they would have avoided the mistake which the blunder of the Jesuits has otherwise rendered almost inevitable.

CLASSIFICATION OF THE TRIBES OF THE EMPIRE OF THE YNCAS.

Ethnological Region.	Tribes.	*Ayllus* or Lineages.
I. THE YNCA REGION.	1. *Yncas.*	Hanan Cuzcos. Hurin Cuzcos. Yncas. Ayamarcas. Quespicanchis. Muynas. Quehuars. Huarucs. Urcos. Chinchapucyus. Rimactampus. Papris. Mascas. Chillquis. Poques. Mayus. Cancus.

* Page 28. † I. pp. 15, 16. ‡ I. p. 17.
§ 'Hist. del Peru,' pp. 74, 77, 138.
‖ Hervas, 'Catálogo de las lenguas de las naciones conocidas,' i. p. 240.

CLASSIFICATION OF THE TRIBES OF THE YNCAS—*continued.*

Ethnological Region.	Tribes.	*Ayllus* or Lineages.
THE YNCA REGION—*continued.*	2. *Canas.*	Ayaviris. Canas. Canches. Caviñas.
	3. *Quichuas.*	Yanahuaras. Chumpi-uilcas. Cotaneras. Cotapampas. Aymaras. Uma-sayus.
	4. *Chancas.*	Hancohuallus. Quiñuallas. Utusullas. Urumarcas. Vilcas. Tacmanas. Pocras. Yquichanos. Morochucos.
	5. *Huancas.*	Sausas. Huancavilcas. Llacsapalancas. Pumpus. Chucurpus. Ancaras. Huayllas. Yauyus.
	6 *Rucanas.*	Rucanas. Soras. Collahuas. Huamanpalpas.
II. THE COLLAO REGION.	1. *Collas.* 2. *Lupacas.* 3. *Pacasas.* 4. *Carangas.* 5. *Urus.* 6. *Collahuayas.* 7. *Quillacas.*	
III. THE CHINCHA-SUYU REGION.	1. *Huanucus.* 2. *Conchucus.* 3. *Huamachucus.* 4. *Casamarcas.* 5. *Chachapuyas.* 6. *Huacrachucus.* 7. *Huancapampas.*	
	8. *Ayahuacas.*	Cassa. Callua. Ayahuaca.
IV. THE QUITU REGION.	1. *Quitus* or *Caras.*	
	2. *Llacta-cuncas.*	16 Ayllus.
	3. *Ancamarcas.*	3 Ayllus.
	4. *Hambatus.*	5 Ayllus.

CLASSIFICATION OF THE TRIBES, &c.—*continued.*

Ethnological Region.	Tribes.	*Ayllus* or Lineages.
THE QUITU REGION—*continued.*	5. *Muchas.*	6 Ayllus.
	6. *Puruhas.*	31 Ayllus.
	7. *Tiquisambis.*	4 Ayllus.
	8. *Lausis.*	9 Ayllus.
	9. *Cañaris.*	24 Ayllus.
	10. *Paltas.*	4 Ayllus.
	11. *Zarzas.*	13 Ayllus.
	12. *Puritaeus.*	
	13. *Cullahuasus.*	
	14. *Linguachis.*	
	15. *Cayambes.*	Many Ayllus.
	16. *Utaballus.*	7 Ayllus.
	17. *Chimbus.*	6 Ayllus.
	18. *Carangues.*	
	19. *Huancavilcas.*	18 Ayllus.
	20. *Mantas.*	8 Ayllus.
	21. *Caras.*	
	22. *Tacamis.*	
V. THE YUNCA REGION.	1. *Colanes.*	
	2. *Ltenes.*	
	3. *Catuctos.*	
	4. *Sechuras.*	
	5. *Morrópes.*	
	6. *Chimus.*	
	7. *Mochicas.*	
	8. *Changos.*	

XII.—*The Principality of Karategin.* By Major-General ABRAMOF, Chief of the Zarafshan District.* Translated from the Russian and communicated by R. MICHELL, F.R.G.S.

THE territories of Karategin,† the valley of the Surkhaù River,‡ and its tributaries, are held to be perfectly independent. They

* We are indebted to Major-General Abramof, the Chief of the Zarafshan district, for these first particulars of a Central Asian State, known to us only by name. On the last maps of Central Asia (such as Kiepert's map of 'Suran oder Turkistan,' 1864) there is a void in that part where Karategin is situated, and only in Sheet 1 of Colonel Walker's map of 1867 do we find the tracing of a road passing through Dervaz (Darbaz) and the eastern portion of Karategin into Kokan. This, in all probability, is the route of Mullah Abdul Medjid, whose journey from Peshawer to Kokan is known to us only through a brief notice in Petermann's 'Mittheilungen' of 1864, p. 158. The original account of the journey is in the 'Selections from the Records of the Government of India, Foreign Department,' No. xxxix. (Papers relating to a Journey to Kokan: Calcutta, 1863). Of all the names of places on the route given in Walker's map, that of Lungur Eshun is the only one that corresponds with any of the names mentioned by General Abramof—we mean Langar-Sha, in Abramof's list.

† According to recent accounts, Karategin has become an apple of discord between several Central Asian rulers.—May, 1870.

‡ Doubtless the Surkhab (*ab* being water) traced in Macartney's map. See Col. Yule's 'Cathay and the Way Thither,' and Preliminary Notice, p. cexxxvi, vol. i.

were only once overrun by the Alai (black) Kirghizes camping on the slopes of the mountains towards Kokan. These Kirghizes were soon expelled, and Karategin has ever since been free of all foreign control.

The River Surkhaù takes its rise in the high mountains, not far from the Áb-i-Pianj* (source of the Oxus), which form the western limits of the so-called "Pamir" table land. The source of the Surkhaù lies below the parallel passing between Kashgar and Yarkand, and for the first 132 miles the river's course is through gorges of extreme wildness. It is said that the high rocky mountains on each side of these gorges admit of only one passage along the river's side, and this is very dangerous, and practicable only for persons on foot; even these are in many places obliged to crawl along. The river valley retains this character as far as the kishlak of Khantia-hota, where its banks gradually widen, and the mountains, declining on both sides, trend away to the north and south. At Tangi-Namasga the southern range is $26\frac{2}{3}$ miles distant from the left bank of the river; beyond that the mountains turn due south, and then extending in a south-westerly direction, die away into undulations at Kuláb. The northern range keeps closer to the Surkhaù, and forms a water parting between that river and the river Kafernihan, without, however, reaching the Ámú.

The waters of the Surkhaù are very abundant—more so than those of the Zarafshan; they run between banks of conglomerate (conglomerate was shown to the people from whose statements these particulars have been written), which are frequently precipitous. At Sar-i-pul the river is more than 7 feet deep. Owing to its depth and great rapidity, it is not fordable. The largest bridge across it is opposite to Sar-i-pul, the length of the bridge being 50 feet. Judging by the bulk of its waters, and the length of its course, this river must be considered to be the chief affluent of the Oxus.

The valley of the Surkhaù is intersected by great numbers of streams, kishlaks being scattered over their valleys, many of which are deep and very picturesque.

Gharm is the chief town of the principality of Karategin. The name of this town is *Karategin* (a name which is not in popular use). It is the place of residence of the ruler Muzafer-Khan, who derives his origin, like the ruler of Darwáz,† from the descendants of Iskander-Zul-Karnein (Alexander the Great). Gharm contains 800 houses. Muzafer commands 2000 soldiers; but in time of war he can assemble from 15,000 to 20,000 men.

The kishlaks in the Surkhaù Valley are disposed in groups.

* *Ab-i-Piänj* is the Panja or Wood's Oxus.

† On the river Ab-i-Piänj, the head-waters of the Amu, chief town Kalai-khum.

Each group has its own Bek, who takes the name of the chief kishlak in which he resides.

The following is a list of these groups, showing their respective distances from the Zinkaù Bekship, and the number of kishlaks, or villages, in each, as well as the situation of the groups relative to the banks of the river:—

	Bekships.	No. of Villages.	Distance in Engl. miles.	Location.
1	Zinkaù*	10	..	Right bank.
2	Yarkhitch	15	23⅓	Ditto.
3	Ghat Khit	20	8	Ditto.
4	Kalyai	40	10½	Left, on the Kalyai-ab.
5	Ghissarak	20	5¼	Right.
6	Khunytch	10	26¼	Ditto.
7	Langar-Shah	30	33	Left, on the Ab-i-Shur stream.
8	Gharm (Karategin) ..	40	10½	Right, in a defile.
9	Sar-i-pul	60	..	Left, in a defile, opposite Gharm.
10	Sarbagh	30	10½	Right, in defile.
11	Dashty-Syak	5	10½	Ditto.
12	Gumysh	6	5¼	Ditto.
13	Sarym-Saly	..	10½	Ditto.
14	Pumbatchi	10	21	Ditto.
15	Naudanak	20	..	Left, opposite Pumbatchi.
16	Mudjikhari	20	30	Right.
17	Alli-Galyadun	10	8	Ditto.
18	Si-Chirak	10	..	Left.
19	Tangi-Namazga ..	10	10½	Right.
20	Ab-i-Gharm	10	5¼	Right, in the mountains.
21	Yusu-Yakhak	12	..	Left.
22	Komarau	25	20	Right, in the mountains, near Sarbotch.

The kishlaks number more than 400, but the average number of houses in each is about 30, so that the population of Karategin may be computed at less than 100,000 of both sexes.

The people of this country are all "Galcha";† they live in separate dwellings, and intermarry only among themselves. Polygamy is very rare. The women do not veil themselves; they are present at all festivities, and receive male guests in their houses. The "kalym"‡ (dower) at a wedding consists chiefly of ewes, goats, horned cattle of a large size, and horses. The "kalym" is proportioned to the wealth and dignity of the bride's

* The situation of the Zinkaù Bekship is not given by the author of this paper, nor does he indicate the point of the compass from which this enumeration begins.

† This is a peculiar race, poor but independent, found in some of these little-known regions east of Samarkand and Bokhara. Their language is Persian, but they are said to differ much from the Tajiks, and to be very swarthy in complexion. They are Sunni Mahomedans. See *Meyendorff*, 'Voyage à Bokhara,' p. 136.

‡ The *Kálim* is rather the price paid to the bride's parents by the bridegroom.

family. From a few ewes it sometimes amounts to hundreds, and to scores of horses. Every man may choose his own bride, and women exercise the privilege of rejecting suitors.

As the people of Karategin are not rich, and possess an insufficient quantity of arable land, families do not live in common as in Samarcand and Tashkend, but a son, on his marriage, is portioned off; a separate establishment is provided for him.

Owing to the difficulty of the roads to and from Karategin, nothing is imported or exported, and the land is cultivated to the extent only of providing for interior consumption. The same is said of the cultivation of gardens.

Cattle breeding is more common; the cattle are small. This pursuit is favoured by the rich pastures in the numerous valleys of the slopes and spurs of the Surkhaù Mountains. The horses of the country are of a peculiarly small and hardy mountain breed. They are rarely shod. The "ishak"* (mule) is not employed, or not so commonly as at the head-waters of the Zarafshan.

The people weave rough woollens, and make biaz (T cloth) and "mata" of cotton brought from Hissar. They make also a kind of cloth of the wool of goats (wild and domestic) and sheep, which is made into chakmens† for winter clothing.

The manufacture of iron is greatly developed in Karategin, as in all the countries at the head-waters of the Oxus. Excellent weapons and firearms are manufactured of iron brought from Hissar and Wantch.‡

The chase after wild beasts is very common. The favourite hunt is after the agu and kiik, the marten, and river otter. The skin of the marten sells at Hissar for 40 to 60 cop. (1*s.* 2*d.* to 2*s.*), and that of the otter for 1 r. to 1 r. 20 c. (2*s.* 6*d.* to 3*s.*).

There are gold washings and salt pits. Gold is said to be more abundant at a place called Sarym-Saly. Ingots, weighing above a pound, are said to be sometimes found there. The process of washing is the same as in other parts of Central Asia.

The salt pits are in the mountains near Langar-Sha. These mountains are very high, and of great extent; the salt, of which the formation of the mountains is composed, lies immediately on the surface. The mountains are in general covered with forests.

Among the noticeable features of the Surkhaù Valley are the

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* *Ishak*, according to both Vámbéry and Redhouse, is an ass, not a mule.

† The chakmen is the "bournous" or cape of the Caucasian mountaineer and Russian Cossack, and is probably the same as the long tunic or chăpkăn of the Hindustani.—R. M.

‡ Wákh in the Darwaz territories on the Ab-i-Piănj. [It is doubtful whether by *Wákh* be meant Wákhán, or the Waksh of the old Arab geographers, which really adjoins; perhaps belongs to Darwaz. This Wakhan certainly does not] From time immemorial iron has been cast here, and steel and iron have been manufactured.

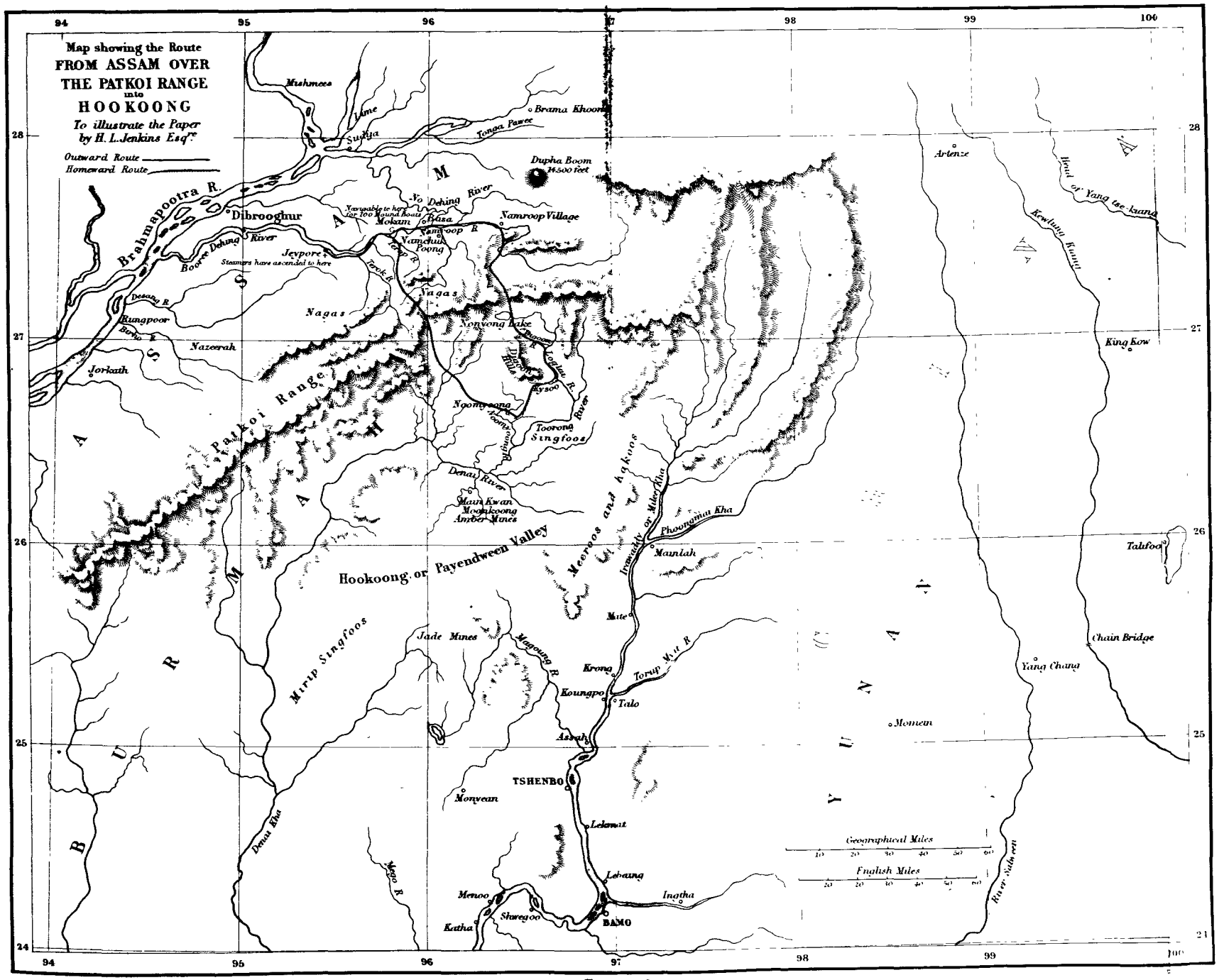
hot springs on the western boundaries of the Karategin territories, near the Ab-i-Gharm kishlak (*gharm* means "hot," *áb* or *ab*, "water"). The temperature of the water is not known, but judging from hearsay, it is very high, and approaches to boiling-point. There is a large shed near the spring, under which the people assemble on festive occasions. Here they feast on mutton, which is dipped raw in the well, and taken out boiled after an hour's immersion. The depth of the well is from 6 feet to 7 feet, and the water in it is always bubbling as in an urn. Two cavities are dug, into which the water is conducted from the spring; in the one nearest the spring the water retains a considerable degree of heat; in the farthest it is of a lower temperature. The people bathe in both of these pools. It may be presumed that the spring water contains an abundance of bicarbonate of lime, which, turning into carbonate, throws out upon the edges of the spring a kind of calcareous stuff; for a sample of the same was shown to the man from Karategin, from whose words this has been taken down, and he at once recognised it as identical with that named the Ab-i-Gharm.

The principal roads leading from the valley of the Surkhaù are:—to Hissar, to Kokan and Kashgar, to Darbaz, and to Macha (near the source of the Zarafshan).

XIII.—*Notes on a Trip across the Patkoi Range, from Assam to the Hookoong Valley.* By H. L. JENKINS.

[Communicated by Robert C. NOBLE, Esq., Calcutta.]

Last year I was unable to get beyond the Nonyong Lake, partly from want of provisions, and partly owing to my having started late in the season; the Singfoos were too busy reaping their crops to accompany me. I attempted to start much earlier this season, with my friend Mr. A. J. Peal; but some of the Singfoos who had agreed to show the road were unfortunately detained by a lawsuit. Waiting for them we lost several days, and ultimately did not leave the last village on the Namroop till the 8th December. Following the path described last year up the Namroop River, and then up the Nambong and Nunkee streams, we reached the summit of the Patkoi about 2 o'clock on the 8th December. To our great disappointment, on examining the barometer we found it broken and useless. Water boiled at a temperature of 208°, giving an altitude of about 2140 feet. The air was very clear, and it was plain to see that the Patkoi, which is here only a single ridge, could be crossed five or six hundred feet lower by making a



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slight bend to the westward of the present path. That night, we descended some three or four hundred feet and camped near a small spring of water.

Continuing the descent very gradually the next day, in an easterly direction, we crossed the stream from the Nonyong Lake about noon, and then ascended the Digoon Hill and stopped at the first water we could find on its eastern slope. We estimated the distance travelled that day at 15 miles. The path lay through thick forest; we lost it several times during the day, and were obliged to halt whilst the Singfoos dispersed themselves in all directions to find it.

Early on the following day we came on a small stream, also called Digoon, and went down its bed for some hours, occasionally skirting the water through dense wet jungle. About noon we struck off from the right bank over a low hill to the Loglai, a shallow but very rapid stream about 80 yards broad. It seemed advisable to camp early, in order to construct better shelter than usual, as rain threatened; so we halted for the night on the sand on the bank of the Loglai, about half a mile below a large poong or salt-ooze. Distance this day about 10 miles.

During the whole of the next day our course lay down the bed of the Loglai, and we made very slow progress at first over the enormous boulders and rocks of sandstone, but the river became larger as we advanced, receiving much additional water from numerous small streams flowing into it on either side. Towards evening large rocks and boulders were less frequently met with, and we got on faster over the sand and shingle. We stopped at the mouth of a little stream called Kysoo, having travelled 11 or 12 miles. Here the Loglai is navigable for canoes, and the extreme width of its bed exceeds 100 yards.

On the 12th, leaving the Loglai, we ascended the Kysoo for two hours, then crossing a low hill came on the Namlip, a stream similar to the Kysoo, and travelled down its bed till evening, camping on its bank. Distance about 16 miles. The path during the whole day was good, the beds of both streams being composed of shingle and gravel, with few large rocks. The forest, as on the Assam side, is composed of very large trees, and the undergrowth of jungle is impenetrably thick.

On the morning of the 13th we found there was barely rice enough in the camp to give each man one meal, so it was necessary to force the pace to reach a village as soon as possible.

Following the Namlip for about an hour, we reached its confluence with the Yoongsoom, a stream of the same size. For four hours the path led up the Yoongsoom, occasionally skirting the water through very heavy and extremely wet jungle until that stream became so small as to be untraceable, when crossing

a piece of high-lying forest land, we came on the Yoongmoi, a somewhat larger stream than either of the two former. About two hours' walk down the bed of the Yoongmoi brought us to the Namyoong, a river not much inferior in size to the Loglai, but deeper and less rapid. We held on our way up this river until it became dusk, when we were glad to learn that the Namyoong village was close at hand. Our guides told us that it would be highly improper for a party of strangers to enter a village after nightfall, so we camped on the sand on the bank of the Namyoong, and sent off two men to the village for food. In about an hour the men returned, bringing with them a good supply of rice and some fish, and they also brought us back our money. On hearing of our necessity, the people of the village had gone round from house to house collecting rice; and with the contributions they sent a message to say that they were not jackals but human beings, and could take no payment from hungry travellers. The Gham, or Chief, sent us an invitation to enter his village in the morning. Distance this day about 24 miles.

On the 14th we went up the river to the Namyoong village, about a mile above our encampment. This was the ninth day since we left the last Assam village; and during this time we had seen no cultivation, not even a bit of clearance, and the sight of the large open rice-fields gave us no small pleasure. Making our encampment on the side of the river opposite to the village, we were soon surrounded by the inhabitants, about 200 in all. They brought presents of fowls, rice, eggs, and fish. It is the Singfoo custom to present a guest with food as soon as he enters the house, and the Gham's wife brought us a small quantity of cooked rice neatly tied up in plantain-leaves, and some "Sahoo," a short of whisky distilled from rice. This spirit was very acceptable, as our own stock was nearly exhausted. It is very strong, and not unpalatable when one becomes used to it.

The Gham, whose name is Ningroo Menoh, was very civil, and told us to apply to him for everything we wanted. After chatting some time, he told us that a messenger had arrived with a letter for us from the Chiefs of the large Singfoo villages on the Denai, and he was good enough to say that the letter should be delivered the next day. We asked for the letter, and to see the messenger at once, but were gravely reproved for wishing to transact business on the very first day of our arrival; and as our own Singfoos agreed that our request was most unceremonious, we were obliged to appear contented.

Early the next morning we made enquiry for the letter, but were again told that our haste was ill-mannered. "The Gham," they said, "eats first, and after that he is at liberty to pay attention to matters of less importance." About noon we

obtained possession of the letter, which was written in Shan, the Singfoos having no written character of their own. A Kamptee boy, who came with us from Assam, read out the contents, of which the following is a translation :—

"Sibbom Gham and Seroj Gham, having consulted all the other Ghams, send this. Jenkins Sahib is not permitted to visit our villages. No European has ever come this way. If the Sahib wishes to see our country, he should come through Burmah. The Ghams will not allow him to come by the Patkoi. He must return.

"By Legandoi messenger."

Ningroo Menoh then handed us another slip of paper conveying to him the following instructions :—

"To NINGROO MENOH.

"Detain the Sahib at your village till you hear from us. If you are unable to detain him or turn him back, send us a message, and let your messenger travel day and night.

"From Sibbom and Seroj Ghams."

On questioning Legandoi, the bearer of these letters, he at first laid the whole blame on the Burmese Woon or Governor of Magong, who, it appears, though he does not attempt to govern the Singfoos, is supposed to exercise political control over them to a certain extent. It would seem, however, that the influence this officer possesses in Hookoong is at present little more than nominal, for the messenger explained that when the Ghams are agreed amongst themselves as to any particular line of conduct, they ignore the existence of the Woon. Burmese authority, he told us, was maintained by the excitement of dissensions amongst the different clans—no single Chief who has any cause of disagreement with his neighbours dares incur the displeasure of the Woon, lest the Chiefs with whom he is at variance should be invited to burn and plunder his village.

Whatever the cause may be, it is certain that the Burmese are heartily detested by the Singfoos.

As our Assam Singfoos refused to go on with us until the prohibition was removed, we determined to send a remonstrance and to wait in the neighbourhood of Namyoong for a reply.

We wrote to the Ghams of the Denai villages that we considered it hard to be detained, reminding them that their people had full liberty to go into Assam whenever they pleased, and that their traders travelled all over Upper Assam unmolested, and we begged them to give us permission to go forward and see them.

On the morning of the 16th we sent off three of our own people with Ningroo Doo, the younger brother of Ningroo Menoh, with our letter and with presents for Sibbom Seroj and four other Ghams of note.

We received no reply till the 25th, when Ningroo Doo returned. He told us that the Ghams, after much discussion, had not come to any agreement up to the time of his leaving them, as to whether we should be allowed to go forward or not, and that, as the small-pox had broken out in some of their villages, the people were averse to any travellers being allowed to move about, wishing to prevent the disease from spreading; he had returned to let us know that there was little probability of our being allowed to go on immediately. It was hardly to be expected, perhaps, that isolated tribes like the Singfoos, unaccustomed to European visitors, would give up their seclusiveness at the first call without some hesitation; but we had lost so much time at the commencement of the journey that neither of us could afford to wait longer, especially as the chance of being allowed to proceed on a very early day seemed to be small. So on the 26th we commenced our return journey through the Mosang Naga country, as we wished to examine the pass by which Griffith and Bayfield crossed the Patkoi in 1837.

This route has already been fully described by Griffith, so it does not seem necessary to say much regarding it. There are four steep ridges crossed by this path rising 3000 to 4000 feet, besides the main range itself, on which we boiled water at a temperature of 202°, the temperature of the air at the time being 63°, giving an altitude of about 5500 feet above the sea-level. It is much to be regretted that Griffith chanced to take this route, for it is doubtless owing to his description that a general impression has arisen that the Patkoi Range is a formidable barrier erected by nature to prevent communication between India and the countries lying to the east.

Whilst at Namyoong village, which he found from observation to be about 26° 30′ lat., we had several opportunities of conversing with the people of the Meeroo tribe who inhabit the mountain range to the east, between Hookoong and the Irrawaddy.

From the description given by the Meeroos there would appear to be several passes of no great elevation through this range. The Meeroos wear Chinese ornaments, and bring articles of Chinese manufacture to Hookoong for sale. Besides these ornaments and their pipes we noticed earthenware cups, copper cooking-vessels, wrought-iron ploughshares, and cast-iron pans, all undoubtedly of Chinese make. Neither the Singfoos nor the Meeroos make any use of copper as a circulating medium.

In the larger transactions they use lumps of silver obtained from Yunnan and from the Shans, of about half a pound weight; and these lumps are unhesitatingly chopped into small pieces and weighed out when it is requisite to measure the price of articles of small value. They have some rupees in circulation, but these coins are looked on with suspicion on account of the impurity of the silver. The dearness of salt was most remarkable: a coarse black salt was selling at about the rate of a shilling a pound. We met with several people who had traded in the Pansee country, and one of the routes they described strikes the Irrawaddy at Mainlah, a large Shan village, situated on the left bank of the Phoongmai at its confluence with the Irrawaddy.

In a little map attached to Dr. Clement Williams's book on Upper Burmah, Mainlah is placed at the mouth of a large river in lat. 26°, or about 130 miles above Bhamo.

Dr. Williams does not give the name of this river, but it is well known to the Singfoos and Meeroos as the Phoongmai Kha.

We were informed that a man carrying a load could reach the nearest Pansee villages from Mainlah in two days' march.

The Singfoos divide the Chinese into two classes—those who eat pork, and those who do not eat pork. The pork-eaters, they said, used formerly to come down the Phoongmai in great numbers and cross into Hookoong for jade and amber; but of late years, owing to war between the two classes, the trade has been restricted to the abstainers from pork. It must be remembered that the route across the Patkoi by the Nonyong Lake is no new scheme now brought to notice for the first time. Thirty-five years ago attention was directed to this same route by Captain Charlton, then commanding the troops on this frontier, who is known to fame as the first man to discover the tea-plant in British India. Captain Charlton writes—his letter will be found in the 'Journal of the Asiatic Society' for January, 1835—"What a pity there is no means of communication between Suddya and Yunnan! A good land-road, and there are no natural obstacles of any consequence to prevent it, would afford an outlet for British merchandise into the very heart of China." As the Singfoos of Hookoong trade with Yunnan and with Assam, it cannot be disputed that Captain Charlton was right in asserting that no physical obstacle exists to prevent a thoroughfare from being established the whole way. It has been urged with some plausibility that the Singfoos are so poor and so simple in their habits, that they do not want better communication with other countries, because they could reap no benefit from free intercourse.

It is true that their wants are few, but some of these wants are very ill-supplied, as in the case of salt for instance, which is very bad in quality and very dear throughout Hookoong; besides, the bulk of the population engage in some kind of barter when not occupied in cultivating, and a people of this kind would not be likely to oppose the opening of a road, because they are capable of seeing that the measure would prove to their advantage.

But whilst the people themselves may be trusted not to oppose their own interests, it must be admitted that some difficulty lies in the fact that nearly all their Ghams are large slave-holders, and suffer heavily and constantly from the escape of their slaves across the border into British territory. All the Chiefs feel a great deal of irritation against us on account of the extreme abolitionist policy that has been adopted of late years. Still, considering the magnitude of the question, it can hardly be said that the cost of indemnifying a score or so of petty Chiefs for the loss of their slaves would be a heavy impost, and it would seem to be no more than fair to give the Ghams the means of purchasing that amount of labour from their servants which they have been accustomed to obtain by force, if we interfere to prevent the exaction.

As there is now a British officer resident at Bhamo, it might be possible to send a party up the Irrawaddy to explore and make a rough survey of the river as far as Mainlah. In all probability, a party starting from Assam would be able to reach Mainlah, for, since we have returned, a letter has been received from the Denai Ghams inviting us to meet them next year at Serojmo.

Serojmo is said to be only six days from Mainlah.

XIV.—*Remarks on the Formation of Fjords and Cañons.* By Dr. ROBERT BROWN, M.A., F.R.G.S., President of the Royal Physical Society, Edinburgh.

IN March, 1869, I presented to this Society a paper "On the Formation of Fjords, Cañons, Benches, Prairies, and Intermittent Rivers," an extract from which was published in the 'Proceedings,' vol. xiii., No. 3, and the entire paper in the 'Journal,' vol. xxix. The doctrines broached have been favourably received on the Continent and in America, and by many of those in this country best able to judge regarding their reasonableness. My paper, however, in so far as regards the theory of the forma-

tion of fjords, has been honoured by two special attacks having been directed against it. The first* of these in time is by Mr. Joseph W. Tayler, so long connected with the cryolite mines of Arksut Fjord, in Greenland; the second† is by the late illustrious President of this Society. Though no words coming from Sir Roderick Murchison on a subject of physical geology can fail to be received with the careful attention and profound respect which his long and pre-eminent services to science entitle them to, and though well aware of Mr. Tayler's long residence in Greenland, yet, with every respect for both, I must humbly submit that they have not made good their case for the doctrine that glaciers have nothing whatever to do with the formation of fjords. On the contrary, after having studied the subject anew, and visited, since my paper was published, several of the regions where fjords abound, and which are cited in illustration of my ideas in the paper mentioned, I am convinced—even more than before—that the explanation I then gave, if not exactly the true one, is at least nearer the truth than the one opposed to it. It is with a view to recapitulate these arguments, and not with a view to bolster up a theory, which must eventually stand or fall on its own merits, that I ask a place in the Society's Transactions for these additional remarks. The question is not so much whether fjords were hollowed out by glaciers, but simply a renewal of the contest between the rival schools of "catastrophists," who believe that all the great physical features of the world have been caused by some cataclysm or cataclysms of nature; and of "uniformitarians," who teach that the uniform and long-continued action of the forces at present acting on the earth's surface would be sufficient to account for many features hitherto ascribed by their rivals to huge throes of nature. The whole subject has been discussed over and over again, and all the main arguments which have been brought to bear against this particular application of the uniformitarian doctrines, have been advanced against some other application of it, in explanation of other physical features. Nor have the supporters of the contrary view been backward in replying; and the whole matter stands *in statu quo*, or as the leanings of physical geologists bear to one side or other of the controversy. Foremost and chief of the school of catastrophists was our distinguished President, and our Transactions almost yearly bear witness to the skill, eloquence, and learning with which he has employed the weapons of his party against the adherents of the opposite view.

Originally, when he visited the Arctic Regions for the first time ten years ago, a disciple of Sir Roderick in this country,

* 'Proceedings,' vol. xiv. p. 156. † Ibid. p. 327.

and of von Buch in Germany, the present writer must confess that additional observation and more extensive travel have led him to desert to the enemy. The paper mentioned is a result of his studies under the new banner, and these further remarks must be taken as his justification of the faith that is in him. The arguments brought against him both by Sir Roderick and Mr. Tayler are so nearly identical, so far as they go, that he may be permitted to reply to them conjointly. Had, however, Mr. Tayler waited until the publication of my complete paper, he would have spared himself and the Society some of his remarks, which his impatience for what seemed an easy victory has induced him to advance against the imperfect statement of my case in the fragmentary report published in the 'Proceedings.' Unfortunately he commences his arguments by entirely misunderstanding my views.

Glaciers and Fjords.—When Mr. Tayler says that he "takes it for granted" that by "hollowing" I mean causing fjords to be where none were before, he takes for granted what I never did grant. On the contrary, I have always shunned the extreme views of either geological school, which would assign the origin of all physical features *alone* to the causes of which they are the advocate. I believe, and consider that in my paper I made it clear, that as a glacier outpour in approaching the coast, or in falling from an elevation, always takes the line of least resistance; so in former times it sought the valleys and depressions then existing in the coast-line of Greenland. It might even have taken the "gulches" and ravines which former volcanic force had formed. But at that time Greenland, Norway, and other fjord-indented countries did not present the aspect they do now. Fjords, as we understand them now, did not then exist. It was to the long-continued action of the glaciers moving over these valley-beds that the deep uniform inlets are due. Probably the sea assisted the glacier after the coast had fallen. At that time the present coast-line of these continents did not exist, and when Mr. Tayler attempts to disprove my theory by talking of the present fjords of Greenland as if they were of primeval origin, I fear that he does not clearly understand the doctrines held by all geologists, that the Greenland coast has been undergoing a continual oscillation. He mixes up, with a curious confusion of ideas, the fjords after they are formed and the causes which formed them. A moment's consideration would convince any one that the coast of Greenland at that time was entirely different from now, and that since these fjords have been formed it has undergone many changes of level.

Grinding Power of Glaciers.—When Mr. Tayler and Sir Roderick Murchison inform us that ice has no grinding power,

and only slides over the rock, they will scarcely expect me to agree with them. This question is as yet *sub judice*, though I am inclined to believe that those who assert the grinding power of ice have made out a very clear case. I cannot understand how any one who has seen the rounded ice-planed hills of Greenland, and the immense mud-laden stream which flows out from under every large glacier, as the result of the grinding action of the ice, by means of its file-like *moraine profonde*, can believe that the glacier merely slides over the surface of the rock without causing any abrading action. Though I cannot allow that Mr. Tayler's long residence in the Arctic regions—principally, I presume, in the vicinity of Arksut Fjord—enables him to come so positively to the conclusion he does, which is only the old theoretical opinion of some geologists, derived from the comparatively puny glaciers of the Alps; yet even there he must have seen the stream laden with clay, pouring from under every glacier, and choking up the neighbouring fjord, and shoaling even the open sea around. Where can this mud have come from, if not from the country underlying the glacier, and the great inland ice of the interior of Greenland; and if from these—as undoubtedly it has—how can any one, with these well-known facts before his eyes, declare that the glacier has little or no abrading power? Mr. Tayler, even when wishing to prove the contrary, states a fact which entirely cuts the ground from beneath his feet. "It is true," he says, "that boulders and *débris*, borne along by the ice, scratch, polish, and grind the rocks to a considerable extent; but, though strong as a transporting agency, ice alone has but little excavating power; it is like the soft wheel of the lapidary—the hard matter it carries with it does the polishing." Exactly so. It is to the geologist a matter of the most supreme indifference whether it is the ice of the glacier itself, or the *moraine profonde*, invariably accompanying it, which does the abrasion of the underlying rocks, *so long as it is done*. And that even Mr. Tayler, in contradiction of his own doctrine, seems to allow. Some opponents of the doctrine of ice-abrasion, who even allow less power to the glacier than Mr. Tayler, always lose sight of the long period during which the glacier must have been acting to form these long fjords or inlets of the sea as they now exist. This allowed—and there is no geologist who will doubt that though the glacial period is but of yesterday in geological time, viewed in the light of human chronology, it is so incalculably distant that it would be vain to attempt to calculate the date of that epoch, and even allowing that the glacier pouring down the Norwegian, British Columbian, or Greenland valley of that date, only removed every year, by means of the sub-glacier

stream, *one* inch of rock or other subcumbent stratum—it requires but a very moderate number of years to excavate the broadest and deepest fjord in the world. At that time the coast was higher than now, and it is the lowering of the coast, combined with the deepening of the valley, that has converted what was once a glacier-valley into a fjord or inlet of the sea. The great error of the catastrophists is, that their method of thought has led them unconsciously to expect the slow and uniform action of the forces of nature—acting from the beginning until now under the control of one uniform unchanged and unchangeable law—to act as rapidly as their "cataclysms" and other prodigious "catastrophes of nature." Mr. Tayler is especially, I think, a little unreasonable in disowning the abrading power of ice, because, in the eighteen years or so during which he was a witness of its power, he did not see it "hollow out" a fjord, and complete it ready for use! After all, the Roman poet, who eighteen hundred years ago saw the rain-drops splashing on the pavement of Tomi, had a clearer idea of the effect of the slow, but constant, action of the forces of nature than some geologists in later times—"Gutta cavat lapidem, *non vi, sed sæpe cadendo.*" Therein lies the whole theory of ice and river action. When we see a smoothly-gliding river excavate cañons thousands of feet in depth through the solid rock, surely it would be inconsistent to deny that an ice-river flowing over the same spot for thousands of years, may, assisted by a huge file, in the shape of the *moraine profonde*, which it carries along with it on its under-surface, and the sub-glacial river to carry off part of the *débris* thus worn, do something approaching to this?

If the advocates of the non-abrading power of ice will not allow that glaciers can convert a valley in course of time into a deep glen, and that then, by the aid of an oscillation of the coast, the sea enters and the glacier floats away in iceberg, and its former bed now becomes the fjord through which they sail, I cannot expect them to give in their adhesion to Professor Ramsay's views regarding the excavation of lake-basins by means of glaciers.* On the contrary, this view of that distinguished geologist, while gaining many converts, has been violently attacked both in this country and on the Continent, yet, I venture to think, without being at all shaken in its main points. Already it has been extensively adopted; and only recently an eminent American naturalist—Professor Newberry, of New York—has applied it to account for the formation of the great American lakes.† Yet Professor Ramsay's theory requires much more of ice than is required of it by mine.

* 'Quarterly Journal, Geological Society,' vol. xviii. p. 185 (1862).

† 'Annals of the New York Lyceum of Natural History' (1869).

Filling up of Fjords.—When Mr. Tayler says that, "instead of glaciers excavating fjords, they are continually filling them up," he must not expect me to follow him; for here, again, he loses the thread of his arguments with a confusion of ideas which renders it quite unnecessary to say more in refutation of what has nothing whatever to do with the subject in hand. It does not at all follow that, because *ancient* glaciers hollowed out the present fjords, the sub-glacial stream flowing into them from *modern* glaciers may not shoal them up. But the modern glacier, like the ancient one, whether ending in the head of a fjord (the bed of an ancient glacier) or at the open sea—as at the great "Iisblink," 15 miles north of Frederikshaab—is, I believe, unquestionably excavating out the valley in which it lies, to become hereafter, in some future period of Greenland history—either through a change of climate or of coast-level—a deep valley or a deeper fjord. I know—as does any one at all acquainted with Greenland—that this great glacier, though it is not the only one, reaches the sea without entering a fjord, and finding the sea too shallow to buoy its seaward end up, and so break it off in the form of icebergs (as in the deep fjords), it pushes its way along the bottom for some distance, until getting into deeper water it will again, like the others, discharge its icebergs. This, again, is quite foreign to the subject of the formation of fjords. There are *modern* glaciers. I spoke of *ancient* ones. Still even the great "Iisblink" spoken of, though it happens—accidentally it may be said—not to enter a fjord, is, nevertheless, by the part of it which lies on land, grinding down the infra-jacent country and acting the part of the *ancient* glaciers which formed the *present* fjords. In regard to this filling up of the fjords by the modern glaciers at their head, this is due to the mud brought down by the sub-glacial stream, and which is again due to the abrasion of the rocks by the incumbent glacier moving over them. In another memoir, 'On the Physics of Arctic Ice as explanatory of the Glacial Remains of Scotland,'* I have entered into a full discussion of this and other points connected with Arctic glaciers, so that it would be needless to take up space here with any *résumé* of my observations. In that memoir I have estimated that, at the very lowest calculation, this glacial mud is accumulating at the *head* of these fjords at a rate of not less than 25 feet thick in a century. Accordingly it has closed some old fjords with ice, the glacier at their head being no longer able to

* 'Quarterly Journal of the Geological Society,' vol. xxiv. (1871), pp. 671–701; and "Das Innere der Grönland," in Petermann's 'Geographische Mittheilungen,' October, 1871.

discharge its bergs, owing to the shallowness of the water, and in some cases, as previously pointed out by Dr. Rink * and Mr. Tayler,† the glaciers are seeking new outlets, on the principle of ice seeking the plane of least resistance. Mr. Tayler asks triumphantly, Why does not the great glacier referred to cut its way through the sand and débris which lie at its base? I answer, Give it time, and most assuredly it will do so. That is, however, not a question at all connected with the *abrading* power of the glacier. It is simply connected with the question of what mechanical force the glacier exerts in pushing forward. When the average rate of the downward and outward progress of a Greenland glacier is only about *five inches* per diem, we must not be in a great hurry to see the solution of the question Mr. Tayler has proposed. But, just as truly as a glacier moves, will this rubbish be shot into deeper water, and the end of the glacier, buoyed off by the deeper water, break off in the form of an iceberg.

The Walls of Fjords.—I am asked, Why were not the soft sandstone, coal, "black lead," &c., of which the sides of many fjords are composed, ground away? Really, it is unnecessary to give an answer. It answers itself. Some glaciers are rather broad, but still they have a limit, and so had these ancient glaciers, whose bed these fjords were; and I suppose that though the "soft sandstone, coal, black lead," &c., which lay in the way, was worn away and floated seaward by the subglacial stream; still, when the glacier reached its limits, what did not come within the area of the action of ice would remain. I believe this does not require a very great tension of the scientific imagination to conceive, and that even my opponent will acknowledge. Mr. Tayler in his, on the whole, short but admirably conscientious description of the Greenland fjords, mentions a fact in support of my theory, viz., that on the rocks on either side of these fjords are ice-markings. I would like him to explain these. It ought, however, to be mentioned that, except where the walls of the fjord are composed of trap, gneiss, or some other hard rock, we must not expect to see many marks of the grooving of the ice which formerly rubbed against them. For the action of the weather, disintegrating the surface of the rocks, or tumbling down huge masses into the sea, frost riving the rocks asunder, as well as the masses which in former times must have fallen on the side of the glacier in the form of lateral moraine, must have all helped greatly to efface any ice-markings which might have been formed.

* 'Grönland Geographisk og statistisk beskrevet,' &c.
† 'Proceedings of the Royal Geographical Society,' vol. v. p. 93 (1861).

Both, however, Mr. Tayler here, and Dr. Rae in some remarks he made at the meeting in support of my views, mention seeing these markings, as I have seen them, both on the sides of these Greenland and Arctic fjords, and in other parts of the world. Mr. Tayler has presented a geological puzzle for my consideration in the form of a Greenland fjord, and asked me to explain its formation on the theory I have advocated. I dare say it would admit of a very simple explanation, were we put in possession of all the facts in connection with it. But, as Mr. Tayler's description is so meagre, until I have seen it myself it would only be mere guess-work to attempt showing its mode of formation. I do not advocate that everything in the shape of an inlet of the sea was formed as I have mentioned. On the contrary, doubtless, many inlets now classed under the name of fjords were originally rifts and chasms in the country from almost primeval times. It would be damaging to any theory to claim for it the merit of explaining every fact of this nature; and it is scarcely fair to adduce some supposed exception to the law enunciated, and thereby attempt to throw overboard all the numerous facts adduced which prove that in the vast preponderance of typical cases it holds true. The glacier-bed theory of fjords is a general theory applied to, and applicable to, all parts of the world where fjords are found; so that because seemingly some glen in Greenland, or elsewhere, *looks like* an exception, it must not be thrown aside. With, however, even less display of ingenuity than has been exerted on throwing it in the way of my theory, it could be accounted for, yet for the reason mentioned I will not attempt this, but leave it to the opponents of the theory to extract from it whatever comfort it is capable of affording them in the way of argument.

Volcanic Theory of the Formation of Fjords.—What explanation the opponents of this glacier-bed theory would adduce is, of course, not difficult to suppose. That fjords were formed by the great volcanic agencies which in former times dislocated the earth's crust is naturally their theory. Mr. Tayler has even invented an hypothesis so ingeniously mechanical that I hope he is not to be taken as a recognized exponent of the doctrines of his school! "It appears," he remarks,* "that at the time of the elevation of the west coast of Greenland, a chain of mountains about fifty miles in breadth, running nearly north and south, was acted on in a wave-like manner, *i. e.*, leaving depressions nearly equal to the elevations, and more or less at right angles with the direction of the chain. These depressions, or long valleys into which the sea runs, constitute the fjords,"

* *Op. cit.*, vol. v. p. 90.

and so on. I am afraid this theory is *much* too ingenious to be accepted by those who know anything of fjords or of igneous action; nor, I fear, is the general volcanic theory, though supported by illustrious names, so well founded as to be unassailable. It is, to say the least of it, very remarkable, if fjords were owing to volcanic action, that they are not as we might expect, found in countries where there has been the most remarkable display of igneous agency, or in countries where volcanic agency is equally well marked with those countries in which fjords are found. On the contrary, fjords are only found in northern and southern latitudes, where glaciers either now form or could have formed, and nowhere else; so that they must in some way be connected with climatal agencies. Again, these fjords are only in the line towards the sea, and always end at the shore, as if the agent which formed them had been like a glacier making its way to the sea. A volcanic rift is entirely different, and would never have shown such a steady uniform system of openings in the earth's surface. If some great subterranean force had formed these openings in the earth's crust we might have expected to find them on flats, in mountains, in sandy tracks, in fact, anywhere—for a great subterranean force would have riven the crust of the earth without regard to locality. The fjords we *always* find surrounded by mountains. Much more could be said, but it would be a mere waste of time; for it must already be evident that, whatever agency has formed these fjords, volcanic agency alone is not the one. I, with all deference to my distinguished opponents, still think that the glacier-bed theory is not untenable, in default of a better.

Ramsay, Dana, Geikie, and Murphy, on Fjords.—The views I have enunciated, both here and elsewhere, regarding the action of Arctic glaciers and glacier fjords, were first suggested to me when visiting both sides of Baffin's Bay and Davis Strait as early as 1861. I afterwards thought a great deal on the subject, during some years of a lonely life, far away from scientific works or intercourse, while exploring the wild fjord-indented shores of British Columbia and Vancouver Island. Afterwards I saw enough in Greenland and Norway to convince me that my early ideas had the germ of truth in them, and that former writers, who had attributed the formation of these to volcanic rifts alone, were not on the right track. I have accordingly, in the course of the foregoing remarks, occasionally styled this "my theory," for, until recently, I was unaware that the idea had ever suggested itself to any one else. Though to me it is a matter of perfect indifference who was the author of it, so long as it is founded on truth, yet, in case it might be supposed

that I am adopting other men's ideas, I hasten to say I have recently learned that, without exactly explaining the formation of fjords as I have done, both Professors Dana and Ramsay had some years previously hinted at a similar explanation; and more recently Mr. Archibald Geikie, Professor of Geology in the University of Edinburgh, and Director of the Geological Survey of Scotland, has suggested that possibly the "lochs" on the west coast of Scotland might be so accounted for. Though none of these gentlemen took exactly the same view as I have done, or gave it such a general application, yet I am glad to have the support of men so able as they. I may be, therefore, excused if I add them as supporters of the glacier-bed theory of fjords.

Professor Ramsay* says, "Furthermore, as the glacialated sides and bottoms of the Norwegian fjords and of the salt-water lochs of Scotland seem to prove, each of these arms of the sea is only the prolongation of a valley down which a glacier flowed, and was itself filled with a glacier. . . . In parts of Scotland, some of these lochs being deeper in places than the neighbouring sea, I incline to attribute this depth to the grinding power of the ice that, of old, flowed down the valleys when, possibly, the land may have been higher than now." Professor Geikie gives utterance to very similar views.† More recently still, Mr. J. Murphy, in a paper read to the Geological Society,‡ some months after mine was read to the Royal Geographical Society, apparently in entire ignorance of the writings of his predecessors, gives utterance to views even more decided regarding the part glaciers have played in the formation of fjords. His words are worth quoting: "Not many coasts in the world are cut up into fjords; and nearly all that are so are western coasts in high latitudes. The fjord-formation is found in North-Western Europe, including Norway, the West of Scotland, and the West of Ireland; in North America from Vancouver Island northward, and in South America from the Island of Chiloe southward. From Vancouver Island to Chiloe is an immense stretch of nearly straight coast-line; but, at these limits, its character changes quite abruptly. The transition from straight to indented coast-lines coincides pretty equally with that from dry to moist climates; and the change from the dry climate of Chili to the moist one of Western Patagonia is accompanied, as we might expect, by a depression of the snow-line on the Andes. It is now generally believed that the prevalence of lakes in high latitudes is, in some way, a result of glacial action: *it can*

* *Op. cit.*, vol. xviii. p. 203. † 'Scenery of Scotland,' pp. 127, 183, &c.
‡ 'Quarterly Journal of the Geological Society,' vol. xxv. p. 354.

scarcely be doubted that this is equally true of fjords, and the coasts I have mentioned are those on which glacial action must necessarily be the most energetic; because west coasts in high latitudes are exposed to west winds (Maury's 'countertrades'), which deposit on the mountains in snow, the moisture they have taken up from the sea."

I do not pit these authorities against the opponents of the glacier-bed theory of fjords; but only to show that, in supposing that glaciers and fjords have an intimate connection, I am not alone, as might be supposed from merely reading the arguments brought against my paper in this Society's 'Transactions.'

Cañons.—Since my paper was read to the Society much further information has been published regarding these curious openings in the earth's surface through which rivers flow, and which I concluded—along with others—were formed by the erosion of rivers. For the chief portion of this information we are indebted to Dr. Bell, who, in his 'New Tracks in North America,' has given a most lucid and accurate account of those of the Colorado River region. With the exception of Sir Roderick Murchison, and, in a modified form, Dr. Foster, of Chicago,* I am not aware that any writers have attributed them to any other agency than the erosive power of rivers, though this theory has now been before the public for a considerable length of time. Sir Roderick, however, again refers to these merely as "the great transverse cracks which opened into fissures and caverns. These openings, made at different times, were then left to be operated upon in subsequent ages by all the waters which fell upon the surface, or by rivers above and below that surface, to be by them abraded and fashioned." Impressed by this opinion of one so competent, and by the much more extensive accounts which have been published since my short paper was originally read to the Society, I have again revised my observations, but without being able to come to any other conclusion than that they are due—as they now exist—to the erosion of rivers. In my paper, following popular parlance, I called the gorges through which many of the North American rivers flow for some distance "cañons." But I ought to mention that, properly, these, though due mainly to river-erosion on the original volcanic clefts, are yet, in many points, different from the great cañons on the Colorado and other rivers further to the south. Of these I embrace the opportunity of speaking more fully in these supplementary remarks. The true cañons are found chiefly in the desert plateau traversed by the Rio Colorado and its tributaries. This region is dry and unproductive

* 'Mississippi Valley,' p. 336.

in the extreme, except by means of irrigation; for, though several rivers flow through it, these rivers all flow in deep cañons or gorges, which drain the country of the water which the soil obtains from the rainfall. The "Big Cañon" of the Colorado is about 238 miles long, and its walls rise up vertically from the river to a height of from 2000 to 4000 feet. On Green River, in the same region, there is another, 190 miles long. Colonel Powell and party, to whom we are indebted for these particulars, starting from where Green River joins the Colorado, passed through a succession of cañons for a distance of 256 miles before they came to the great cañon. As I remarked in my former paper, each tributary has its own cañon, and the sub-tributaries also often have cañons. The strata through which these rivers have cut their way are chiefly brown, grey, and orange-coloured sandstones, greatly inclined, "beneath which marble and granite have been deeply trenched." Though prepared to agree, so far, with Sir Roderick Murchison and Dr. Foster in allowing that, possibly, some of these rivers may have originally taken advantage of old volcanic rents, yet I scarcely think it admits of a doubt that the cañons, *as cañons*, were formed by continuous river-erosion, and that a vast number of these were worn by the rivers right through the strata, without any assistance from plutonic action. Dr. Newberry has shown that nowhere is there any trace of fracture or disturbance, and that when the bottom of a cañon is dry, its bed shows no sign of dislocation. "Indeed, when we consider the intricate ramifications of these cañons, so precisely similar to the ordinary outlines of a drainage system over a low, flat country, it seems impossible to conceive any agency capable of producing such ravines, save the streams which flow through them." The conditions necessary for the production of a true cañon are:—1st. The erosive power of the stream must be greatly in excess of that of the other forms of atmospheric denudation. The rainfall must be small, or so equally distributed as to reduce pluvial action to a minimum. Frosts must be equally rare and unimportant. The main streams drawing their supplies from a distance, and from whatever source, must be contained in sufficient volume to keep their channels full, either for the whole or a great part of the year. 2nd. There must be a considerable uniformity in the rocks which the stream is called upon to cut through: not that it should be necessarily soft, but it must be uniform in texture and structure. Hence such rocks as the Colorado cuts through, both in texture and geological position afford great facilities for the river acting on them. However, when once a river has cut its channel so deep that it cannot leave it, it does not matter much to the aspect of the cañon even if the rock should vary.

The upper portion of the Colorado cuts through sandstone, limestone, &c., while the lower is excavated in marble or granite. The country must be sufficiently high above the sea to give the river fall enough to generate a current sufficiently strong to sweep away the detritus which it wears out of the river bottom, and to cause the gravel on which it rolls along to wear holes in the bed of the stream, and generally act as an excavator.* Thus I see no reason to doubt that rivers have dug out these wonderful cañons, inch by inch, and that they are daily deepening them, by means of the same agencies which originally sunk them into deep beds, from the shallow valley through which their first waters, in bygone ages, took their way to the sea. I consider, however, that, in former times, these rivers were fuller than now, and especially during the close of the glacial epoch; for, as I have repeatedly demonstrated, contrary to the hasty generalization of Whitney, Foster, and others who have followed in their wake, there are abundant evidences of glacial action over the Pacific slope of the Rocky Mountains.†

In closing these remarks, I may say that, though I cannot see my way to alter my views to those of my opponents, I am by no means certain that after-discoveries may not cause us materially to modify our beliefs. However, in the present state of our knowledge, the theory which I have adopted, and have endeavoured to enforce, is, I am convinced, more consonant with truth and reason than any other. For this reason I shall continue to hold to it until a better is proposed, when I will be the first to abandon my own; for the first aim of science, and the highest ambition of a scientific student is, and should be—*truth*.

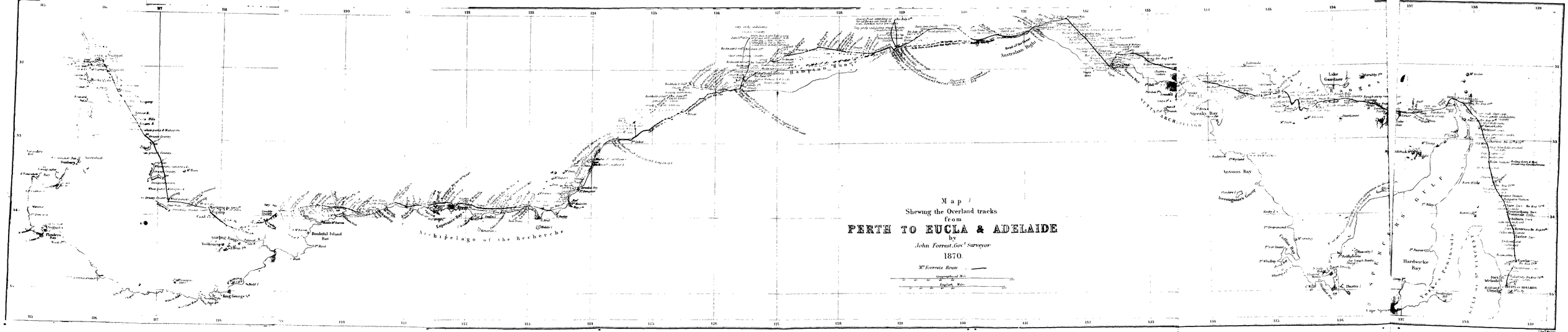
EDINBURGH, *February 12th*, 1871.

Note.—Since this communication was written, a paper by Mr. Justice Begbie, of British Columbia, 'On Benches or Valley Terraces,' has been read to the Society, and gave rise to an interesting discussion.‡ The theory of their formation there enunciated in no material manner differs from that given by me when discussing the subject in a former paper read before the Society.§

* See a good abstract of recent observations on Cañons, by Mr. A. Geikie, in 'Nature,' vol. i. p. 436.

† Silliman's 'American Journal of Science and Art,' Nov. 1869; 'Transactions of the Geological Society of Edinburgh,' 1869, p. 19; and Petermann's 'Geographische Mittheilungen,' 1869, p. 5.

‡ 'Proceedings,' vol. xv. (1871) pp. 133-146. § 'Journal,' vol. xxxix.


Map
Shewing the Overland tracks
from
PERTH TO EUCLA & ADELAIDE
by
John Forrest Esq.r Surveyor
1870.
Mr Forrests Route
Geographical Miles
English Miles
Archipelago of the Recherche
Doubtful Island Bay
Esperance Bay
Middle I.
Mid.
Hampton Range
Australian Bight
Head of the Bight
Eucla
Nullarbor Plain
Streaky Bay
Anxious Bay
Investigators Group
Lake Gairdner
Flinders I.
Thistle I.
Hardwicke Bay
Port Lincoln
Adelaide
Gulf St Vincent
Yorke Peninsula

XV.—*Journal of an Expedition to explore the country from West Australia to Port Eucla, and thence to Adelaide, South Australia.* By JOHN FORREST, Government Surveyor.

[Abridged.]

EVERYTHING being in readiness, and having given the master of the *Adur* instructions to leave on the 6th of April (1870), and sail to Esperance Bay, there to await my arrival, our party left Perth, accompanied, for a short distance on our march, by his Excellency the Governor and aide-de-camp, together with several other friends. We had 15 horses, and provisions sufficient to take us to Esperance Bay.

On April 5th we reached Kojonup, and stated for Jerramungup on the 9th, reaching it on the 13th, our route being *viâ* Martinup, Koorarkup, &c. We were very short of water on this part of our journey. On April 14th we left Jerramungup, steering a little to the north of east, over scrubby undulating sand plains, for about 16 miles. Camped on a small branch of the Fitzgerald River, at water, on some granite rocks called "Dwertup;" very little feed for our horses.

April 15th.—We travelled to the north of east, and at 7 miles crossed the main branch of the Fitzgerald River: granite rocks in bed, and salt-water pools. After travelling over stony undulating country for 21 miles, camped on a small patch of feed, with water in some granite rocks, called "Coombedup." Next day, continuing easterly over rough stony country, crossing several brooks with salt pools of water in them, we reached the Phillips River, and, after a great deal of searching, found some fresh water in a small brook near the river. The immense pools in the Phillips were as salt as the sea. Distance travelled, about 25 miles.

On April 17th, Sunday, I went, in company with McLarty, to the summit of a high hill in Eyre's Range, called "Annie's Peak," which we reached after 1½ hour's hard climbing. It is the steepest hill I ever attempted to ascend. We had a splendid view of the sea, the first since leaving Perth; and I also obtained a fine round of angles and bearings. In the evening it almost suddenly came on to thunder and lightning, and soon rained in torrents; and as we were rather unprepared, we did not pass a very pleasant night.

April 18th.—Just as we had collected the horses it commenced to rain in torrents; we, however, got under way by 9 o'clock, and steered in about an easterly direction over sandy

scrubby country, and at 10 miles crossed a brook with salt pools in it, and, continuing, reached a large river of salt-water, which we followed about 2 miles, and camped near it at a spring called "Jerdacuttup." It rained in torrents the whole day, blowing hard from the southward; we were all drenched when we halted. On April 19th, after travelling about 23 miles in an easterly direction, we reached a salt lake called Parriup, and camped. Procured water on some granite rocks near camp. On April 20th we reached Mr. Campbell Taylor's station on the Oldfield River, and rested for the remainder of the day.

April 21st.—After starting the party, with instructions to reach and camp on north side of Stokes' Inlet, distant about 20 miles, I went with Mr. Taylor to the mouth of the Oldfield River, in order to take bearings to East Mount Barren, &c., but was disappointed, the weather being very hazy. Accompanied by a native of Mr. Taylor's, followed on the tracks, but night setting in, we made the best of our way to where I expected to find the party, but could see nothing of them, and were obliged to camp for the night without food, and, what was worse, without a fire, having neither matches nor powder with me. Luckily I had my rug, by which means I fared much better than my companion, who had only a small kangaroo skin. It blew and rained in torrents most of the night, and our position can be better imagined than described.

Early on the morning of the 22nd we were looking for the tracks of the party, but without success; finally we returned 8 miles to the Margaret River, and, after a long search, found the tracks, almost obliterated by the rain, and followed along them. Upon nearing Stokes' Inlet we met Tommy Windich looking for us, he having seen our tracks and last night's bivouac. He informed me that they had camped about 4 miles westward of the Inlet, and we had therefore passed them in the dark last night. Made all haste to overtake the party, and managed to do so, after a great deal of trouble, 1½ hour after dark. Encamped on north side of Barker's Inlet, at a small well of water called Booeynup. We did justice to our supper, as I had not had anything to eat for 32 hours.

April 23rd.—For the first 9 miles over scrubby sand plains, kangaroos very numerous, when we came into and skirted a chain of salt lakes and marshes, and continuing over generally low country, well grassed, for 5 miles, we reached and camped at the old homestead of the Messrs. Dempster, called "Mainbenup."

It was not till April 29th that the *Adur* arrived. They had had very heavy weather, but everything was dry and

safe. We landed stores, &c., required for immediate use, the next day.

On May 9th, after collecting the horses, we saddled up and started *en route* for Israelite Bay, whither I had instructed the master of the *Adur* to meet us. Bidding good-bye to our kind friends at Esperance Bay, we travelled along the north shore for about 11 miles, when we left the coast and steered towards Mount Merivale, and camped at a spring on south-east corner of a salt lake, Mount Merivale bearing N. 60° E. mag., Frenchman's Peak N. 150° E. mag., and Remarkable Island N. 196° E. mag. The country for the last few miles was beautifully grassed, with numerous brackish streams running through it. Commenced keeping watch this evening, two hours each, from 8 o'clock P.M. to 6 o'clock A.M. Marked a tree with the letter F. at our bivouac.

Next day we travelled nearly due east for 24 miles, through scrubby sandy country without timber. Remarkable bare granite hills were seen in every direction. Camped at a spring on south-east side of granite hills, resembling a saddle. Passed Mount Hawes, leaving it a little to the north. On May 11th, the horses having strayed back on the tracks last night, we were delayed till 10 o'clock, when only eight of them were brought in. Sent Tommy in search of the remainder, and after waiting until 3 o'clock for his return, sent on my brother, Osborn, and Billy with 7 horses and loads, with instructions to camp at the first place where there was feed and water, there being no feed at this camp. McLarty and myself waited until Tommy returned, which he did at sundown, having had to go back 24 miles to our bivouac of the 9th for them. There being scarcely any feed here, and as it was too late to follow after the party, we tied up our horses for the night. We packed up next morning and followed on the tracks of the party, and at 10 miles found them camped on a branch of a creek which runs into "Duke of Orleans Bay;" brackish streams plentiful. Scrubby sandy country.

May 13th.—Travelled in an easterly direction towards Cape Arid, passing at 5 miles a large creek, and at 10 miles encamped on a running brackish stream, which I named the Alexander. Scrubby open country most of the way. Shot a few ducks from the thousands that are in these rivers. Continuing, next day, a little to the south of east for 10 miles, crossed a large brook, and at 14 miles reached another creek, which we followed up a mile, and encamped on east side of a large salt-lagoon, into which the brook empties. Splendid green feed around camp, but no water; went with Billy to look for some, and after going

1½ mile east, struck the Thomas River, where we met two natives, quietly disposed, who showed us the water, and, after filling our canteens, returned with us to camp.

May 15th, Sunday.—Shifted camp over to the Thomas River, 1½ mile, where there was plenty of water; rained a little during the day. Grassy piece of country round camp, the first good feeding-land seen since leaving Mount Merivale. Next day we got an early start and steered nearly east, accompanied by the two natives, over scrubby sand-plains for about 21 miles. We camped near the sea, a few miles to the westward of Cape Pasley. Filled our canteens about 2 miles back from where we camped.

May 17th.—Steering in an E.N.E. direction for about 19 miles, we camped near Point Malcolm, Mount Ragged bearing N. 327° E. mag., and Point Dempster (Israelite Bay) N. 35° 15′ E. mag. Hope to reach Israelite Bay to-morrow, as it is only 16 miles distant. There was no water at Point Malcolm, but luckily we had filled our canteens. The wind was strong from the westward, accompanied with light showers all day. Tommy shot a kangaroo this evening, and the two natives who were travelling with us from the Thomas River did ample justice to it, literally eating the whole night. After starting the party next morning, we went in advance with Billy to prepare the camp at Israelite Bay, &c. When we reached it were delighted to find the *Adur* lying safely at anchor, and proceeding on board, found all well. Procured abundance of water by digging 1 foot deep in the sand-hills, and good feed a short distance from camp. We were soon joined by the party, all of whom were overjoyed at meeting the boat safely. We were two days behind our time, and the boatmen were beginning to feel anxious, not being acquainted with the many delays that may take place on a land journey.

We landed a few of the stores, barley, &c., and pitched a large canvas tent, as I intended staying here eight or ten days to recruit our horses, which, owing to scarcity of feed, I may say since leaving Kojonup, were in rather low condition, and a few gave signs of knocking up; I therefore concluded, as this was the last place we would meet the boat until we reached Eucla, to give them as much rest as possible, there being fine feed near camp. We found the coast to be in many places out of position, as shown on the Admiralty charts.

On May 30th, after bidding good-bye to the crew of the *Adur* and to the two natives who have accompanied us from the Thomas River, but who were now at the end of their country and afraid to come any further with us, we left Israelite Bay

en route for Eucla, and steered in a northerly direction for about 15 miles over salt-marshes and claypans, with dense thickets intervening, destitute of grass, when I was obliged to make for the coast, and following it for about 8 miles, we camped close to it, without water or feed, and tied up our horses in latitude 33° 17′ 17″ by meridian altitude of Arcturus, *a* Bootis, &c. Next day we saddled up at dawn and continued along the beach for 4 miles; came to a large sand-patch, and found abundance of water by digging 1 foot deep in the hollows. Camped on each side of the sand-hills, with first-rate feed for our horses.

June 1st.—After starting the party, went with Tommy Windich to examine the country to the north-west, and, after travelling 9 miles over salt-marshes and samphire-flats, with dense scrub intervening, we reached what is called on the Admiralty charts "The Front Bank," which we ascended, and found it very steep and rough. On gaining the summit, we found the country receded to the north, level and thickly wooded, as far as the eye could reach. We travelled about 4 miles to the north-west, from whence we ascended the range, and then climbed a tree to have a view of the country, which I found very level and thickly wooded with Mallee, &c. I therefore determined to turn east, and, if possible, reach the party to-night. Turning easterly, we reached the sea and followed the tracks of the party, coming up with them at about 10 P.M., encamped on north-east side of an immense sand patch, about 25 miles from our last night's bivouac. There was abundance of water on the surface, in the hollows of the sandhills. There being no feed near camp, we saddled up next morning and continued towards Point Culver for 4 miles and camped, with only some coarse grass growing on the white sand-hills for our very hungry horses. Found plenty of water by digging. This was a poor place for our horses; and next morning we started with my brother and Billy to examine the country to the north-east, and travelled in about a north-easterly direction for 25 miles over very level country, but in many places most beautifully grassed. We camped on a splendid flat, without water.

June 4th.—Started at dawn and travelled in a southerly direction for 9 miles, when we found a rock water-hole containing 1 gallon, and had breakfast. Continuing for 4 miles, we reached the sea-cliffs, which fell perpendicularly into the sea, and although grand in the extreme, were terrible to gaze upon. After looking very cautiously over the precipice, we all ran back quite terror-stricken by the dreadful view. Turning our course westward along the cliffs, we reached camp at 5 o'clock,

and found all well. We saw several natives' tracks during the day.

We now made preparations for starting on Tuesday morning and attempting to reach the water shown on Mr. Eyre's track, in longitude 126° 24′ E., 150 miles distant; by carrying thirty gallons of water with us and walking in turns, so as to have the horses to carry the water. I intended allowing each man one quart and each horse two quarts per day, and felt very anxious as to the result, as it would take five or six days; but it was the only resource left. I was much relieved by the sanguine way in which the party acquiesced in my plans, and the very apparent confidence they placed in me.

June 7th.—Started at 9 A.M., carrying over 30 gallons of water with us (one of the drums leaked so much that we left it at camp), and travelled along our outward tracks of the 4th and camped at our former bivouac, with splendid feed, but no water for our horses. Next morning we started early, and steered about north-east through dense Mallee thickets, destitute of grass or water, for 18 miles. We came upon a small patch of open grassy land, and camped without water for our horses. This is the second night our horses have been without water, but the grass has been fresh, and they do not appear to have suffered much yet. Marked a tree at camp, "F., 1870."

Made an early start next morning, steering north-east, and at 1 mile found a rocky water-hole containing 15 gallons, which we gave our very thirsty horses, and continuing, chiefly through dense Mallee, &c., thickets, with a few grassy flats intervening, for 22 miles, found another rock water-hole holding about 10 gallons, which we also gave the horses, and, after travelling 1 mile from it, camped on a large grassy flat, without water for our horses. Our horses were very thirsty, and had yet 70 miles to go before reaching the water, in longitude 126° 24′ East.

Steering E.N.E. next day over generally open country, grassy flats, &c., thinly wooded, for 21 miles, found a small rock water-hole containing 3 gallons, which we put into our canteens, and, after travelling 3 miles further, camped on the edge of a grassy flat, and gave our horses ½-gallon each from our canteens.

Our horses were fearfully distressed in the evening. For the last 96 hours they have only had 2 gallons each.

June 11th.—Found, on collecting the horses, that 4 were missing. Those found were in a sad state for want of water, and there was not a moment to lose. I therefore at once sent Tommy to look for those missing, and, after saddling up, sent the party on with my brother, with instructions to steer easterly

for nearly 50 miles, when they would reach the water in longitude 126° 24′ East. I remained behind to await Tommy's return, and, after an hour's awful anxiety, was rejoiced to see him returning with the ramblers. We lost no time in following after the party, and at 2 miles came to a water-hole they had emptied and given to the horses (15 gallons), and at 5 miles overtook them. After travelling 10 miles, found in another water-hole 15 gallons, which we also gave our horses, which were still very thirsty. At 14 miles found a water-hole holding 3 gallons, which we transferred to our canteens; and at 15 miles camped on a small, but very grassy, flat, close to which we found a water-hole of 10 gallons, which I intend giving the horses to-morrow morning. Although the horses are still very thirsty they are much relieved, and are willing to feed.

On June 12th we struck a little to the south of east over generally grassy country, slightly undulating for 3 miles, and found a large water-hole with about 100 gallons of water in it. It being Sunday, and men and horses very tired, I halted for the day, as there was most luxuriant feed round camp. Our horses soon finished the water, and looked much better after it. Although without water, we are now in comparative safety, as our horses have had nearly sufficient, and we are only 32 miles from the water shown on Mr. Eyre's chart.

June 13th.—Made an early start, and steered a little to the south of east, making straight for the water, in longitude 126° 24′ E. At 18 miles got a view of the sea, and beheld the sand-hills about 15 miles ahead. Here we saw some natives' fires close to us. Approaching them, we came upon an old woman, and my brother and Tommy soon brought a man to bay. There were about twenty round us; they appeared very frightened. After detaining them half an hour, and treating them as kindly as possible, we bade them farewell and continued our journey. They were entirely naked. After leaving the natives, we came to where the cliffs recede from the coast, in longitude 126° 12′ E. To the westward, those grand precipitous cliffs, from 200 to 300 feet high, and Point Dover, near which Mr. Eyre's overseer was murdered, we could clearly see; and, while thinking over his hardships and miseries, we turned our faces eastward, where we could see, within a few miles, the water we so much needed. We soon descended the cliffs to the sea-shore, which we followed for about 12 miles, and reached the first sand-patch at about 10 o'clock P.M. There was good feed round the sand-patch, but we could not find any water in the dark. Gave our horses all we had with us, viz., about 15 gallons.

June 14th.—This morning searched the sand-patches for water without success; I therefore packed up and proceeded towards another large patch, 4 miles distant, going in advance with Billy. After we left, Tommy found a place where water could be procured by digging, and used by the natives; he, however, followed after Billy and myself. On reaching the sand-patch we found a place where we obtained water by digging; we also found sufficient to satisfy our horses, on some sandstone flats. We were soon joined by the remainder of the party, who were overjoyed to be in perfect safety once more, and we were all thankful to that Providence which had guarded us over 150 miles without our finding permanent water. We soon pitched camp and took the horses to the feed, which was excellent. Returning, we were surprised to see a vessel standing in for the shore, and soon made her out to be the *Adur*. Although the wind was favourable for Eucla, she still made in for the land until within 3 miles, when she turned eastward, and, although we lit fires, &c., was soon out of sight. I afterwards ascertained that they were not sure of their longitude, having no chronometer on board, and therefore wished to see some landmark.

We dug two wells next day, and found good water at 7 feet from the surface. Lined them with stakes and bushes, to keep them from filling in. In the afternoon we all amused ourselves by shooting wattle birds, and managed to kill fifteen. On the 16th we dug another well and bushed it up, as the supply from the two dug yesterday was not sufficient, and obtained a plentiful supply of splendid fresh water. By a number of observations, camp is in latitude 32° 14′ 50″ South, and longitude 126° 24′ East, the variation of compass being about 1° 6′ easterly. The horses are improving very quickly, there being splendid feed round the sand-patches.

June 17th.—Went with Tommy Windich for a walk eastward along the beach, and returned a little inland. Passed over some patches of beautiful grassed country, and saw a pine-pole standing on one of the hummocks near the beach, probably erected by Mr. Eyre, as I am not aware of any one else having been here. We could not find any of his camps, however, as no doubt the sand had long since covered them over.

June 20th.—Started this morning, in company with McLarty and Tommy Windich, to explore the country to the northward. The first 12 miles north was through dense thickets and sandy hills, when we reached the cliffs, which we ascended with difficulty; and steering about N.N.E. for 3 miles, through dense Mallee thickets, we emerged into a generally grassy country, with

beautifully grassed downs. We camped at a rock water-hole of 15 gallons, about 25 miles from main camp.

Steering about north for one mile next day, we found a rock water-hole holding about 30 gallons; and continuing for 13 miles over grassy plains, thinly wooded, the country became very clear and open, and at 25 miles there was nothing in view but gently undulating plains of grass and salt-bush. Far as the eye could reach to the north-west, north, and north-east, this clear grassy country extended; and being now 50 miles from camp, the prospect of finding water diminishing as we travelled northward, I determined to return, and accordingly struck south-west, and after travelling 12 miles found a small water-hole of 3 gallons, and camped for the night.

Saddled up at dawn next morning, and steering southerly over clear open grassy plains for 28 miles, we reached the cliffs, and rested an hour; after which we continued our journey, and reached camp a little after dark, finding all well.

June 24th.—Started at 8.30 A.M., *en route* for Eucla. Steering in a N.N.E. direction for 15 miles, reached the cliffs, and after following along them 2 miles, found a large rock water-hole, but almost inaccessible. While I was examining the cliffs near, to find a place where we could get the horses up, Tommy heard a coo-ey, and after answering it a good many times, we were surprised to see two natives walking up towards us, unarmed. I approached and met them; they did not appear very frightened, and at once began to eat the damper I gave them. We could not understand anything they said. I beckoned them to come with us, which they at once did, and followed so closely after me as to tramp on my spurs. They pointed to water further ahead. After walking behind me about a mile, we saw four more running after us, who on joining us made a great noise, singing and appearing very pleased. Shortly afterwards two more joined us, making eight in all. They were all entirely naked, and circumcised. We found the water alluded to, on the top of the cliffs, and as it was too late to attempt to get the horses up, we turned off to the southward half a mile, and camped on a small grassy flat, without water for the horses. The eight natives slept at our fire. We gave them as much damper as they could eat. They had not the least particle of clothing, and made pillows of each other's bodies, resembling pigs more than human beings.

Travelling in an E.N.E. direction on the 25th for 21 miles, over rich grassy table-land plains, thinly wooded, we camped on a very grassy spot, without water for our horses.

June 27th.—Made rather a late start, owing to some of the

horses straying. Steered in an E.N.E. direction, and at 10 miles found a small water-hole, and at 21 miles another, the contents of which we gave our horses, and at 24 miles camped on a grassy spot, without water for our horses. For the first 15 miles grassy, gently-undulating, splendid-feeding country, extended in every direction, after which there was a slight falling off; scrubby at intervals.

We made a late start next day, steering in about an E.N.E. direction for the first 5 miles, over very grassy flats, &c., when it became more dense and scrubby until 20 miles, after which it improved a little, and at 24 miles we camped on a grassy rise, without water, in lat. 31° 41′ S., and long. 127° 40′ E. Our horses appeared distressed for want of water, the day being very warm.

June 29th.—During the day we found water in small rock-holes sufficient to give each horse about 3 gallons. The country was generally very grassy, although in some places rather thickly wooded. Steering next day in an easterly direction over generally grassy country, with occasional Mallee thickets, for about 22 miles, we came to a splendidly grassed rise, and found a fine rock water-hole on it, containing about 100 gallons, which our horses soon finished, being fearfully in want, as the day was very warm.

July 1st.—Travelling about east, over most beautifully grassed country, at 5 miles we found a large water-hole, holding 100 gallons; but our horses were not thirsty, and did not drink much. This is the first rock water-hole we have passed without finishing, since we left Point Culver. At 10 miles we reached the cliffs, or Hampton Range, and had a splendid view of the Roe Plains, Wilson's Bluff looming in the distance. Descending the cliffs with difficulty, we followed along the foot of them, which was beautifully grassed, and after travelling 12 miles, beheld the Eucla sand-hills. I never before remember witnessing such joy as was evinced on this occasion by all my party. After proceeding 5 miles further we camped close to the cliffs, at a small water-hole.

We were now again in safety, Eucla being only 7 miles distant, after having travelled 160 miles without finding permanent water, — in fact, over 300 miles, with only one place where it was obtainable, viz., in long. 126° 24′ E.; and I trust we all recognised with sincerity and thankfulness the guiding and protecting Hand which had brought us through in safety.

July 2nd.—Started early and steered straight for the anchorage, distant about 5 miles, having first ascended the Range,

to obtain a view of the country, which was very extensive. Far as the eye could reach to the westward, the Roe Plains and Hampton Range were visible; while to the eastward, lay Wilson's Bluff and the Delisser sand-hills; and 3 miles west of them we were delighted to behold the good schooner *Adur*, riding safely at anchor in Eucla Harbour, which formed by no means the least pleasing feature of the scene to our little band of weary travellers.

On the 15th we resumed our march at daylight, and travelled E.N.E. for 7 miles, when we bore east over generally level country, well grassed, but entirely destitute of water. We camped at sundown on a grassy rise, without water for our horses. Distance travelled, 34 miles. Our horses have not had any water for two days, and begin to appear distressed.

Next day, at 4.50 A.M. got under way, steering a little to the south of east, in order to make the cliffs, as there might be water in rock-holes near them. At 18 miles came to the sea, but could find no water. At 30 miles saw a pile of stones, and at 33 miles saw a staked survey line. Camped on a grassy piece of country, 2 miles from the sea. This is the third day without a drop of water for our horses, which are in a frightful state. Gave them each 4 quarts from our water-drums, and hoped by leaving a little after midnight, to reach the Head of the Bight next evening.

July 17th.—Was obliged to get up twice to bring back the horses, and at 4 o'clock made a start, the horses being in a very exhausted state. Some had a difficulty in keeping up. About noon I could descry the land turning to the southward, and saw, with great pleasure, we were fast approaching the Head of the Great Australian Bight. Reached the sand-patches at the extreme Head of the Bight just as the sun was setting, and found abundance of water by digging 2 feet deep in the sand.

Gave the horses as much as I considered was safe for them to have at one time. I have never seen horses in such a state before, and I hope never to again. The horses which four days ago seemed strong and in good condition, now appeared but skeletons, eyes sunk, nostrils dilated, and thoroughly exhausted. Since leaving Eucla to getting water at this spot, a period of nearly ninety hours, our horses had only had one gallon of water each, which we gave them from our water-drums. It is wonderful how well they performed this journey; had they not been in excellent condition, they never could have done it. We all felt very tired, as for sixty hours I had only about five hours' sleep, being continually in

a state of great anxiety; besides all having to walk a great deal.

We reached Fowler's Bay on the 28th of July, and Adelaide on the 27th of August.

I have attempted to give a faithful and correct account of our proceedings; and, in conclusion, beg to make a few remarks respecting the character and the capabilities of the country travelled over. In about long. 124° E. the granite formation ends, at least on and near the coast; and from long. 124° to the Head of the Bight, a distance of over 400 miles, there is no change in the formation, being limestone and high table-land the whole distance.

The portion most suited for settlement is, I believe, between long. 126° 12′ E., and long. 129° E., near Eucla Harbour, or, in other words, the country to the north of the Hampton Range, that district being most beautifully grassed, and, I believe, abundance of water could be procured anywhere under the Range, by sinking 20 or 30 feet. There is also under the Hampton Range a narrow strip of fine grassy country, for the whole length of the range, viz., about 160 miles. I have every confidence that, should this country be settled, it would prove a remunerative speculation, and if water can be procured on the table-land, would be the finest pastoral district of Western Australia.

Before I conclude, I have the pleasing duty to record my entire appreciation of every member of the Expedition. I need not particularise them; one and all had the interest and welfare of the Expedition at heart, and on no occasion uttered a single murmur.

Finally, my best and most sincere thanks are due to his Excellency Governor Weld, for the very efficient manner in which the Expedition was equipped; and it is chiefly owing to the great zeal and desire of his Excellency that I should have everything required that the success of the enterprise is attributable.

XVI.—*Results of the Observations taken by* Mr. R. B. Shaw *during his Journey to Yarkand in the year* 1870. Calculated by William Ellis, F.R.A.S., of the Royal Observatory, Greenwich.

1. General Remarks.

As regards the index correction of sextant, the values given by Mr. Shaw have been duly applied throughout. For days on which determinations are wanting, no correction has been applied, excepting in a few instances in which the value given on an adjacent day was used. The corrections are small; their omission is therefore of little importance except in the case of lunar distances, in three of which—Sept. 5, Moon and Saturn; and Sept. 20, Moon and Jupiter, and Moon and Sun—on account of the difference between the values determined on Sept. 1 ($-23''$) and Sept. 9 ($+15''$) and between Sept. 19 ($-30''$) and Sept. 22 ($+27''$), no correction was applied.

In the calculation of refraction, Bessel's tables have been used, the barometer and thermometer readings being either directly taken, or assumed, as necessary, from the numbers given in Table X.

2. Calculation of Latitude.

The observations available for determination of latitude are meridian altitudes of the Sun, Saturn, and α Aquilæ, and altitudes of the Pole Star out of the meridian. The meridian altitudes require no further remark than that in the case of the sun the lower limb is understood to have been observed. For reduction of the Pole Star altitudes, the error of the watch was determined on each evening from the observations of altitudes always also made of some equatorial or quick-moving star, using in the calculation an approximate value of latitude: the latitudes were then directly calculated. The results of all these observations are given in Table V.

3. Calculation of Longitude from Observed Lunar Distances.

For reduction of these observations the error of the watch was calculated from all available observations, employing not only the altitudes specially taken for the purpose, but also, as seemed desirable, any of those of the objects to which the moon, in the measurement of lunar distances, was referred. On each

day the mean of the watch errors thus obtained (giving weight according to the number of observations in each group) was used for reduction of the several lunar distances, assuming throughout a rate for the watch such as the watch errors seemed to indicate as necessary to be made. In a few cases no altitudes of the Moon, or of the body referred to, were observed; and in some instances the variation between the altitudes observed could not be considered as uniform for proportioning the altitude for the time of observation of distance. The altitudes have therefore been all directly calculated. For three stations there are no observations for latitude, those given by Mr. Shaw are therefore used. They are for Yangee-bazar, 38° 19′; Ooeetoghrak, 37° 33′; and Camp Somdo, 35° 1′. For determination of the true distance, the method given by Chauvenet, in his 'Spherical and Practical Astronomy,' was employed. In the cases of the Moon and Jupiter, and the Moon and Saturn, it is supposed that the distance of the *centre* of the planet was observed. The 'Nautical Almanac' distances have been corrected for the error of the Moon's place, as determined from the Greenwich Observations, and the longitudes then deduced in the usual way. The values so obtained are given in Table VI. They show a difference in the results depending on the position of the Moon east or west of the object referred to. The numbers available for determination of an approximate correction for this difference are given in Table VII. The necessary correction being ascertained, the concluded longitudes, as shown in Table VIII., were found.

4. Magnetic Declination (Variation of the Compass).

Little remark is here required. From observed altitudes of the sun, his true azimuth has been found for the times of observation of magnetic azimuths; and Table IX. contains the mean value of magnetic declination for each day thence determined. For Khoosh-Maidân and Leh the latitudes given by Mr. Shaw were used (35° 32′ and 34° 10′ respectively). The resulting values of magnetic declination are not accordant.

5. Heights of Places above the Mean Level of the Sea.

These results are determined from observations of the boiling-point of water. The observed boiling-points were converted into corresponding barometer readings (see Table X.) by the table given at page 78 of vol. ii. of Schlagintweit's 'Scientific Mission to India and High Asia.' The heights were then calculated on

two assumptions:—1. By reference directly to the level of the sea. 2. By reference to Leh. In referring to the level of the sea, the barometer reading at the mean level of the sea was assumed to be 29·92 in., and the temperature of the air 70°. In referring to Leh, the mean barometer reading at Leh has been taken: for July, 19·677 in.; for August, 19·740 in.; and for September and October, 19·763 in. The temperature of the air for July and August (to the 15th) has been taken = 70°; from Aug. 16th to 31st, = 67°; from Sept. 1st to 10th, = 64°; from Sept. 11th to 20th, = 60°; from Sept. 21st to 30th, = 50°; and for October, = 40°. These values for Leh are founded on observations made there during the months of July, August, and September, of the year 1856, and which are printed at page 58 of the volume of Schlagintweit already referred to; the height of the cistern of the barometer employed being taken 11,532 feet. (See the same volume, pages 58 and 446.) The heights were in both cases calculated by the tables, pages 71 to 77 of the same volume of Schlagintweit, taking the latitude = 35°, and the average humidity of the atmosphere = 50 (complete saturation being = 100). The results of these calculations are given in Table X. The values for Leh show that Mr. Shaw's single observation produces nearly the same result as that adopted (11,532) for Leh. It will be remarked that there are determinations of heights of some places both in the journey northward and again in returning southward.

TABLE I.

Observations for Longitude, Latitude, Variation of the Compass, and Heights of Places above the Sea Level, taken by Mr. R. B. SHAW *during his Journey to Yarkand in* 1870.

TABLE I.—OBSERVATIONS FOR LATITUDE BY MERIDIAN ALTITUDES; AND DETERMINATION OF THE BOILING-POINT OF WATER.

Date.	Place of Observation.	Object Observed.	Meridian Altitude. (Half Observed Angle in Mercury.)	Boiling Point of Water.	Temperature of the Air.	Remarks.
1870.			° ′ ″	Fahr. °	Fahr. °	
	[Leh (Ladak), October 23] ..	..	..	192·1	53	Boiling-points taken in steam (Casella's instrument).
July 14	Chagra (near Pangong Lake)	..	..	186·1	62	
,, 15	Masimik Pass	..	..	176·0	51	
,, 15	Pangloong	..	..	182·4	50	(Mercurial barometer 16·251 in.).
,, 16	Pamzal	SATURN	33 41 30	185·4	81	(Ditto 17·425 in.; air temperature 87·5°).
,, 17	Ditto	..	..	186·0	70	Boiling-points taken in water after this.
,, 18	Gogra	SATURN	33 38 30	184·8	62	Semi-correction for Index error of sextant + 30″.
,, 19	Hot Springs	..	..	184·1	72	
,, 19	Camp below Pass (Junction of Stream).	SATURN	33 30 0	183·0	70	
,, 20	Summit of Pass (Dr. Cayley's)	..	..	178·4	55	Mercurial barometer (as above) 14·9 in.; attached thermometer 62°.
,, 20	Nischoo	..	..	180·0	48	Ditto 15·23 in.; attached thermometer 73°.
,, 21	Camp in Lingzee-Tung ..	..	..	181·7	50	
,, 23	Camp in Lak-zang	..	..	182·1	67	
,, 25	Tarldat	..	..	183·6	55	
,, 26	Patsalang	..	..	182·5	71	

July	31	Kâfir Darra (1st Camp) ..	ALTAIR	62	21	15	188·2	60	
Aug.	1	Ditto (2nd Camp) ..	..		..		188·9	..	
,,	2	Ditto ditto ..	..		..		189·4	68	
,,	5	Balakchee	..		..		190·7	65	
,,	6	Toghra Soo	ALTAIR	61	59	45	..	..	
,,	7	Pilatagach	..		..		192·6	62	
,,	8	Camp below Grim Pass (south side).	..		..		190·5	55	
,,	9	Top of Grim Pass	..		..		183·2	46	
,,	9	Kichik Yeilâk	SATURN	31	13	10	191·1	45	
,,	10	En route below ditto, 2 miles	SUN	68	38	15	..	..	
,,	10	Tam	..		..		196·5	64	At 7 P.M.
,,	11	Camp Choochoo	..		..		193·2	64	At 2 P.M.
,,	12	Choochoo Pass	SUN	67	53	0	..	..	Semi Index correction of sextant −3″.
,,	13	Camp Arpalak	..		..		197·0	73	
,,	16	Sanjoo	..		..		200·6	80	
,,	16	Ditto	..		..		200·9	70	At 6 P.M.
,,	17	Langar Soolâghaz	SUN	65	56	45	..	..	Doubtful observation.
,,	17	Koshtak	..		..		201·6	75	
,,	18	Ooeetoghrak	..		..		201·8	85	
,,	19	Bora	SUN	64	59	45	202·3	87	Semi Index correct. sextant − 5″.
,,	20	Kargalik	SUN	64	22	0	204·0	86	
,,	21	Poskiam	..		..		205·0	79	
,,	22	Yangee-bazar	..		..		205·0	74	
,,	25	Yarkand	SUN	62	9	15	..	..	Doubtful observation (clouds).
,,	25	Ditto	ALTAIR	60	8	50	..	..	
,,	26	Ditto	SUN	61	49	50	..	..	
,,	27	Ditto	SUN	61	28	50	205·6	89	Semi Index correct. sextant − 5″.
,,	31	Ditto	..		..		204·9 205·1	86 78	Semi Index correct. sextant − 12″.
Sept.	2	Ditto	..		..		205·8	75	
,,	3	Ditto	..		..		205·9	78	

TABLE I.—OBSERVATIONS FOR LATITUDE BY MERIDIAN ALTITUDES; AND DETERMINATIONS OF THE BOILING POINT OF WATER.—*continued.*

Date.	Place of Observation.	Object Observed.	Meridian Altitude. (Half Observed Angle in Mercury.)	Boiling Point of Water.	Temperature of the Air.	Remarks.
1870.			° ′ ″	Fahr.	Fahr.	
Sept. 4	Yarkand	..	..	205·9	79	
,, 6	Poskiam	..	..	205·1	72	
,, 7	Kargalik	..	..	204·5	76	
,, 8	Bora	..	..	203·3	60	
,, 9	Ooeetoghrak	..	..	201·9	73	
,, 10	Koshtak	..	..	201·8	73	
,, 11	Sanjoo	..	..	201·0	66	
,, 13	Tadlek	..	..	195·3	49	
,, 14	Kichik Yeilak	..	..	191·8	42	
,, 16	Grim Pass	..	..	183·3	43	1 P.M.
,, 17	Pilatagach	..	..	193·1	50	
,, 19	Olbek (near Shahidoolla) ..	SUN	54 51 10	192·3	55	
,, 21	Camp Sooget	..	..	189·6	47	
,, 22	One mile beyond ditto	SUN	53 49 45	..	..	Semi Index correct. sextant + 13″.
,, 23	Chibra	SUN	53 37 30	182·9	48	Ditto ditto + 10″.
,, 23	Malikshah	..	..	185·1	35	
,, 24	Six miles beyond ditto ..	SUN	53 26 3	..	..	Ditto ditto nil.
,, 24	Camp by Cayley's Lake ..	..	..	183·0	35	
,, 25	Summit, Karatagh Col	SUN	53 14 17	181·4	37	
,, 25	Camp near Shorjilga	..	..	183·1	33	
,, 26	Khoosh-maidan	..	..	184·8	35	Semi Index correct. sextant + 12″.
,, 29	Shing-loong	SUN	52 14 25	183·0	33	Observation doubtful.
,, 30	Two miles beyond ditto ..	SUN	51 54 12	..	..	Index correction nil.
,, 30	Camp Somdo	..	..	182·4	36	
Oct. 1	Under Pass (4 miles from Somdo).	SUN	51 39 45	..	..	

Oct.	1	Top of "Col" leading on to Lingzee-tung.	..	..			180·9	48		
,,	1	Camp, corner of Lingzee-tung	..	..			181·2	27		
,,	4	Camp, foot of Glacier Pass (south side).	..	..			181·0	22		
,,	5	Camp at turning-point in bed of torrent.	..	..			183·0	28		
,,	6	A mile above ditto	Sun	49	46	20	..	..	Semi Index correct, sextant − 9″.	
,,	8	Camp 6th, across water-shed beyond lake.	..	..			182·1	30		
,,	9	Three and a half miles beyond last Camp.	Sun	48	30	10	..	..		
,,	9	Camp 7th in Chaghdo-Loongpa (valley).	..	..			183·9	32		
,,	13	Camp Kotelik on Shayok ..	..	..			187·6	29		
,,	13	Three and a quarter miles beyond Kotelik.	Sun	47	12	0	..	..	Semi Index correct, sextant + 7″.	
,,	14	Miles 5 beyond Camp 11th ..	Sun	47	1	22	..	..		
,,	15	Miles 4 beyond Camp 12th ..	Sun	46	48	42	..	..		
,,	16	Camp 13th, Dong-yeilak ..	..	..			189·7	41		
,,	16	Miles 2 beyond ditto	Sun	46	30	50	..	..		
,,	16	Camp 14th, opposite mouth of Changchenmo Stream.	..	..			190·2	33		
,,	17	Miles 4 beyond Camp 14th ..	Sun	46	18	0	..	..		
,,	20	Camp 17th	..	..			192·6	32	About 8 A.M.	
,,	20	Miles 1¾ beyond Camp 17th (Tabilsa Rocks).	Sun	45	7	30	..	..		
,,	21	Camp 18th, "Phagra"	..	..			193·2	34	7 A.M.	
,,	21	Camp 19th (above Digar) ..	..	..			188·6	35		
,,	22	Top of Digar Pass	..	..			181·0	19	1 P.M.	
,,	23	Leh	..	..			192·1	53	Noon.	

The numbered Camps in the above Table are reckoned from the Camp in the corner of Lingzee-Tung (or plain) where the expedition divided: Mr. Forsyth and Dr. Henderson returning to Leh viâ Chang-chenmo, and Mr. Shaw trying a new route by the Shayok.

TABLE II.—OBSERVATIONS FOR LATITUDE BY ALTITUDES OF THE POLE STAR OUT OF THE MERIDIAN.

Date.	Place.	Object.	Observations for Time.		Observations of Pole Star.		Semi Index Correction of Sextant.
			Time by Watch.	Altitude (Half Observed Angle in Mercury).	Time by Watch.	Altitude (Half Observed Angle in Mercury).	
1870.			P M.		P.M.		
			h. m. s.	° ′ ″	h. m. s.	° ′ ″	
July 16	Pamzal	ALTAIR	9 58 30	53 13 30	10 8 0	33 48 30	+ 30
			10 2 0	53 46 30	10 9 45	33 50 0	
			10 3 30	54 1 0	10 11 50	33 50 0	
					10 13 45	33 51 0	
					10 15 15	33 51 30	
,, 18	Gogra	ARCTURUS ..	9 40 40	40 38 0	9 54 15	33 52 45	
			9 42 45	40 11 15	9 57 30	33 54 45	
			9 44 30	39 49 15	9 59 30	33 55 15	
			9 46 20	39 27 45			
			9 48 10	39 4 20			
,, 23	Lak-zang.. ..	ALTAIR	9 42 30	53 38 45	9 59 15	34 43 45	
			9 46 0	54 10 30	10 3 15	34 46 0	
			9 48 0	54 32 0	10 5 30	34 46 30	
			9 49 45	54 45 15	10 8 0	34 47 0	
			9 51 45	55 4 15	10 9 30	34 48 5	
,, 25	Tarldat	ARCTURUS ..	9 27 0	40 39 30	9 36 30	34 50 0	
			9 28 30	40 19 45	9 38 30	34 50 0	
			9 29 30	40 6 30	9 40 15	34 51 45	
			9 31 15	39 46 15	9 41 45	34 51 45	
			9 32 15	39 34 15	9 42 45	34 52 45	
Aug. 1	Kâfir Darra (2nd Camp).	ARCTURUS ..	10 14 15	28 29 55	10 1 45	36 5 30	
			10 16 30	28 0 15	10 4 30	36 7 0	
			10 19 0	27 31 45	10 7 30	36 7 30	

Aug.	17	Koshtak	Arcturus ..	7	13	15	41	25	30	9	2	15	37	29	15	− 3
				7	14	50	41	3	45	9	5	30	37	29	20	
				7	16	40	40	43	0	9	9	0	37	31	15	
										9	11	45	37	32	45	
										9	13	40	37	33	5	
,,	19	Bora	Arcturus ..	7	57	15	42	18	15	9	56	0	37	40	15	− 5
				7	59	15	41	54	45	9	58	30	37	41	30	
				8	0	40	41	39	15	10	0	30	37	42	15	
				8	2	30	41	15	15	10	3	0	37	43	45	
				8	4	55	40	59	15	10	4	45	37	44	0	
,,	20	Kargalik	Arcturus' ..	9	36	15	21	32	45	9	48	45	38	3	0	
				9	40	15	20	48	0	9	51	15	38	3	45	
				9	43	45	20	6	30	9	54	15	38	4	0	
										9	55	45	38	4	0	
										9	58	0	38	5	55	
,,	27	Yarkand	α Coronæ Borealis.	9	52	30	29	42	45	10	16	0	38	57	50	− 5
				9	55	15	29	10	55	10	18	30	38	58	45	
				10	2	15	27	50	10	10	21	15	38	59	30	
				10	5	50	27	10	45	10	23	50	39	0	15	
				10	9	15	26	31	30	10	26	30	39	1	20	
,,	28	Ditto	α Lyræ	11	8	20	53	42	45	11	27	10	39	21	50	
				11	10	40	53	15	0	11	29	45	39	22	23	
				11	13	0	52	48	15	11	32	50	39	23	25	
				11	14	45	52	28	20	11	35	15	39	23	30	
				11	17	0	52	2	55	11	37	30	39	24	17	
Sept.	4	Ditto	Arcturus ..	7	23	0	30	46	35	9	25	45	38	55	55	
				7	25	20	30	20	0	9	28	30	38	56	30	
				7	26	50	30	2	0	9	31	0	38	56	40	
				7	28	45	29	40	0							
				7	30	28	29	20	0							

TABLE III.—LUNAR OBSERVATIONS

Civil Date.	Place.	Name of Object.	Observations for Time: Time by Watch.	Observations for Time: Altitude (Half Observed Angle in Mercury).
1870.			P.M. h. m. s.	° ′ ″
Sept. 1	Yarkand	SUN	5 15 30	11 38 12
			5 40 20	6 48 0
		α LYRÆ ..	10 19 45	58 52 55
			10 23 55	58 4 20
			10 27 45	57 21 7
			10 30 55	56 45 20
			10 34 30	56 4 0
,, 4	Ditto	ARCTURUS ..	7 23 0	30 46 35
			7 25 20	30 20 0
			7 26 50	30 2 0
			7 28 45	29 40 0
			7 30 28	29 20 0
,, 5	Yangee-bazar (ferry over the Yarkand River). (Latitude 38° 19′).	ARCTURUS ..	7 56 45	22 52 40
			7 59 30	22 20 5
			8 1 20	21 58 35
			8 3 30	21 31 40
			8 5 50	21 5 20
,, 9	Ooeetoghrak .. .. (Latitude 37° 33′).	MOON .. .. (lower limb).	9 15 35	31 21 15
			9 19 7	31 49 0
			9 20 45	32 1 57
			9 22 45	32 16 45
			9 25 0	32 34 12
			9 27 30	32 52 30
		α ARIETIS ..	10 56 48	43 11 17
			11 0 0	43 50 0
			11 2 28	44 19 45
		ALTAIR ..	11 17 55	38 46 45
			11 20 10	38 22 5
			11 22 30	37 55 55
		CAPELLA ..	12 44 50	37 18 40
			12 46 30	37 46 20
			12 48 10	38 2 30

FOR LONGITUDE.

OBSERVATIONS FOR LONGITUDE.													REMARKS.
Time by Watch.			Altitude of Moon (Half Observed Angle in Mercury).			Name of Second Object.	Altitude of Second Object (Half Obs. Angle in Mercury).			Distance.			
P.M. h.	m.	s.	°	′	″		°	′	″	°	′	″	
5	15	30		..		SUN	11	38	12		..		Sun and Moon lower limb
5	20	15	34	46	30	..		..			..		
5	25	35		..		..		..		75	30	0	
5	27	40		..		..		..		75	30	50	Distance nearer limbs.
5	30	0		..		..		..		75	31	30	
5	34	10	34	7	30	..		..			..		
5	40	20		..		SUN	6	48	0		..		Observation doubtful lowness of Sun.
7	5	20	25	57	32								Full Index correct, sextant
7	13	0		..		ALTAIR ..	52	45	15				
7	25	15		..		..		..		66	21	35	
7	29	28		..		..		..		66	19	30	Distance Moon's further from Star.
7	32	25		..		..		..		66	18	10	
7	34	38		..		..		..		66	17	35	
7	37	15		..		..		..		66	16	10	
7	42	10		..		ALTAIR ..	56	15	30				
7	45	8	20	46	0								
9	10	10		..		α PEGASI ..		..		37	15	15	Stopped by clouds.
7	17	30	27	32	42								
7	24	35		..		SATURN ..	26	55	0				
7	30	45		..		..		..		29	7	40	
7	34	8		..		..		..		29	9	20	Distance planet and M nearer limb.
7	36	35		..		..		..		29	9	30	
7	40	45		..		..		..		29	10	50	
7	44	0		..		..		..		29	12	0	
7	48	40		..		SATURN ..	25	6	15				
7	51	8	25	15	0								
10	59	45		..		α ARIETIS	43	47	1		..		Full Index correct, sextant
11	20	12		..		ALTAIR ..	38	21	35				
11	36	15		..		..		..		54	48	0	
11	43	10		..		..		..		54	49	50	Distance Moon's nearer and Altair. (Full Moon).
11	47	30		..		..		..		54	50	40	
11	49	40		..		..		..		54	51	10	
11	52	15		..		..		..		54	52	0	
12	1	50		..		..		..		52	27	27	
12	5	5		..		..		..		52	26	40	Distance of α Arietis and M nearer limb. (Full Moon).
12	7	35		..		..		..		52	25	20	
12	11	15		..		..		..		52	24	10	
12	13	55		..		..		..		52	23	0	
12	19	55		..		ALTAIR ..	26	57	55				

TABLE III.—LUNAR OBSERVATIONS

Civil Date.	Place.	Name of Object.	Observations for Time.	
			Time by Watch.	Altitude (Half Observed Angle in Mercury).
1870.			A.M. h. m. s.	° ′ ″
Sept. 19	Camp Olbek, near Shahidoolla ..	SUN .. .. (lower limb).	9 0 10	42 12 30
			9 2 40	42 35 40
			9 4 31	42 53 17
,, 20	Ditto	MOON	4 51 10	59 26 12
			4 53 15	59 48 47
			4 55 0	60 8 30
		SUN .. .. (lower limb).	7 33 45	27 10 0
			7 35 30	27 29 35
			7 36 55	27 45 30
			7 38 30	28 3 10
			7 40 16	28 23 25
			P.M.	
,, 22	One mile beyond Camp Sooget ..	SUN .. .. (lower limb).	2 51 32	32 29 0
			2 53 12	32 10 30
			2 54 40	31 55 0
			2 55 48	31 42 5
			2 57 23	31 25 0
,, 30	Camp Somdo, near head of Karakash River. (Latitude 35° 1′).	SUN .. .. (lower limb).	4 12 35	17 4 0
			4 13 55	16 48 0
			4 15 25	16 35 0

The barometric pressure and temperature may be gathered

FOR LONGITUDE—*continued.*

OBSERVATIONS FOR LONGITUDE.													REMARKS.
Time by Watch			Altitude of Moon (Half Observed Angle in Mercury).			Name of Second Object.	Altitude of Second Object (Half Obs. Angle in Mercury).			Distance.			
A M. h.	m.	s.	°	′	″		°	′	″	°	′	″	
8	52	0	52	29	47	..		..			..		Full Index correct. sextant – 30′ Moon's upper limb.
9	2	27		..		SUN ..	42	33	49		..		Sun's lower limb.
9	51	50		..		..		..		77	0	35	
9	55	55		..		..		..		77	0	32	
10	4	0		..		..		..		76	56	40	Distance Sun and Moon's nearer limbs.
10	7	10		..		..		..		76	56	2	
10	16	20		..		..		..		76	52	10	
10	19	30		..		..		..		76	50	35	
10	22	40		..		..		..		76	50	0	
10	25	0	34	5	0	..		..			..		Moon's upper limb.
10	32	0		..		SUN	53	8	0		..		Sun's lower limb.
4	53	8	59	47	50	JUPITER ..		..			..		Moon's lower limb.
5	0	15		..		..		..		24	20	40	
5	4	25		..		..		..		24	22	10	
5	8	5		..		..		..		24	23	35	Distance Moon's further limb from planet.
5	10	33		..		..		..		24	24	10	
5	12	50		..		..		..		24	25	15	
5	15	20		..		..		..		24	25	45	
5	19	10		..		..		..		24	27	30	
5	23	37	65	13	20	JUPITER ..		..			..		Moon's lower limb.
9	53	40	50	16	15	..		..			..		Moon's upper limb.
9	56	30		..		SUN (l. l.)	49	45	0		..		Sun's lower limb.
10	1	15		..		..		..		65	12	15	
10	6	10		..		..		..		65	10	5	Distance Sun and Moon's nearer limbs.
10	8	0		..		..		..		65	9	45	
10	9	55		..		..		..		65	8	55	
10	11	50		..		..		..		65	8	0	
P.M. 12	8	0	46	50	15	..		..			..		Full Index correct. sextant + 27 Moon's upper limb.
12	10	10		..		SUN (l. l.)	53	6	15		..		Sun's lower limb.
12	18	40		..		..		..		39	38	42	
12	21	55		..		..		..		39	37	48	Distance Sun and Moon's nearer limbs.
12	23	50		..		..		..		39	37	45	
12	26	10		..		..		..		39	36	2	
12	29	25		..		..		..		39	34	30	
12	34	15		..		SUN (l. l.)	51	41	35		..		Sun's lower limb.
12	41	40	40	16	30	..		..			..		Moon's upper limb.
12	49	50		..		SUN (l. l.)	50	15	0		..		Sun's lower limb.
12	53	40		..		..		..		39	24	35	Distance Sun and Moon's nearer limbs.
1	8	45		..		..		..		39	15	45	
1	16	45		..		..		..		39	12	0	
1	29	10		..		..		..		39	7	30	Ditto do.
1	31	30		..		..		..		39	5	30	
1	32	50		..		..		..		39	5	0	
1	37	45		..		SUN	44	28	20		..		Sun's lower limb.
4	26	30		..		..		..		71	14	35	Full Index correct. sextant + 10
4	29	40		..		..		..		71	15	37	Distance Sun and Moon's nearer limbs.
4	32	45		..		..		..		71	16	35	
4	34	30		..		..		..		71	16	50	
4	35	50		..		..		..		71	17	42	

from the Boiling-points and temperatures given in Table I.

TABLE IV.—OBSERVATIONS FOR VARIATION OF THE COMPASS.

Date.	Place.	Time by Watch (For Interval).	Sun's Altitude (Half Observed Angle in Mercury).	Magnetic Bearings.	REMARKS.
1870.			° ′ ″	°	
Aug. 25	Yarkand	..	61 34 45	168·5	
			61 49 50	[177·7]	On meridian.
			61 34 45	187	
,, 31	Ditto	..	13 17 15	265	
			11 56 42	266·5	On prime vertical.
			10 36 6	267	
		H. M. S.			
Sept 14	Kichik-Yeilâk	11 39 38	55 57 43	..	Semi Index correct. sextant + 5″.
		11 44 30	..	186·25	By short double altitude near the meridian.
		11 47 20	..	186·5	(Doubtful observation).
		11 50 45	..	187·5	
		11 52 10	55 35 47		
,, 19	Camp Olbek	11 27 30	54 48 0	..	Semi Index correct. sextant − 15″.
		11 41 0	..	184·5	
		11 44 15	..	185·75	Ditto ditto.
		11 47 40	54 15 0		
,, 22	One mile beyond Camp Sooget ..	11 42 45	53 48 55		
		11 51 30	..	180·5	
		11 53 10	..	181·5	
		11 56 55	..	183·25	
		12 4 30	53 20 0		
,, 23	Chibra	11 41 23	53 36 50		Semi Index correct. sextant + 10″.
		11 42 40	..	176·25	
		11 46 0	..	177·25	
		11 49 20	..	179·25	
		11 51 15	53 29 45		

Sept. 24	Six miles beyond Malikshah	11	41	0	53	25	0	.. Index correct. Nil.
		11	43	0		..		179
		11	47	0		..		180·25
		11	51	0		..		183·25
		11	53	0	53	14	35	
,, 25	Summit of Karatagh Col	11	38	50	53	13	35	
		11	41	20		..		180
		11	46	20		..		182
		11	48	50	53	5	50	
,, 27	Khoosh-Maidân	9	25	0	43	44	35	
	(Latitude 35° 32′).	9	26	0		..		134
		9	27	0	44	0	40	
,, 29	Shing-loong	12	1	0	52	9	55	.. Meridian altitude.
		12	2	0		..		182·25 Semi Index correct. sextant + 12″.
		12	3	0	52	7	55	..
		12	4	0		..		182·5
		12	5	0	52	5	27	..
		12	6	0		..		182·75
		12	7	0	52	3	10	..
		12	8	0		..		183·6
		12	9	0	52	0	0	..
		12	10	0		..		183·75
,, 30	Two miles beyond Shing-loong ..	11	48	0	51	54	12	.. Meridian altitude.
		11	50	0		..		177 Index error. Nil.
		11	58	0	51	48	17	..
		12	0	0		..		181·75
		12	2	0	51	44	0	
Oct. 24	Leh (Ladâk)	11	52	0	43	50	0	
	(Latitude 34° 10′).	11	54	0		..		179
		12	0	0		..		181
		12	2	0	43	40	30	

The above Observations were taken with a prismatic compass placed on a stand which was made perfectly horizontal by means of a spirit-level; and well removed from any iron.

TABLE V.—RESULTS of the OBSERVATIONS for LATITUDE.

Month and Day. (Civil).	Name of Place.	Object Observed.	Resulting Latitude North.	Mean of Separate Results.
1870.			° ′ ″	° ′ ″
July 16	Pamzal	Saturn	34 14 53	34 14 59
,, 16	Ditto	Pole Star	34 15 4	
,, 18	Gogra	Saturn	34 17 58	34 18 53
,, 18	Ditto	Pole Star	34 19 47	
,, 19	Camp below pass (junction of stream).	Saturn	34 26 27	
,, 23	Lak-zang	Pole Star	35 5 20	
,, 25	Tarldat	Pole Star	35 17 40	
,, 31	Kâfir-Darra (1st Camp)	α Aquilæ	36 10 51	
Aug. 1	Kâfir-Darra (2nd Camp)	Pole Star	36 19 58	
,, 6	Toghra Soo	α Aquilæ	36 32 24	
,, 9	Kichik Yeîlâk	Saturn	36 43 32	
,, 10	En route below Kichik Yeîlâk 2 miles.	Sun	36 43 59	
,, 12	Choochoo Pass	Sun	36 53 46	
,, 17	Langar Soolâghaz	Sun	37 17 8	
,, 17	Koshtak	Pole Star	37 22 28	
,, 19	Bora	Sun	37 35 28	37 33 59
,, 19	Ditto	Pole Star	37 32 29	
,, 20	Kargalik	Sun	37 53 34	37 54 2
,, 20	Ditto	Pole Star	37 54 30	
,, 25	Yarkand	Sun	38 25 9	
,, 25	Ditto	α Aquilæ	38 23 33	
,, 26	Ditto	Sun	38 23 47	
,, 27	Ditto	Sun	38 23 51	38 24 41
,, 27	Ditto	Pole Star	38 25 36	
,, 28	Ditto	Pole Star	38 25 38	
Sept. 4	Ditto	Pole Star	38 25 15	
,, 19	Olbek (near Shahidoolla)	Sun	36 26 23	
,, 22	1 mile beyond Camp Sooget	Sun	36 17 14	
,, 23	Chibra	Sun	36 6 7	
,, 24	6 miles beyond Malikshah	Sun	35 54 20	
,, 25	Summit, Karatagh Col	Sun	35 42 39	
,, 29	Shing-loong	Sun	35 8 42	
,, 30	2 miles beyond Shing-loong	Sun	35 5 44	
Oct. 1	Under Pass (4 miles from Somdo).	Sun	34 56 50	
,, 6	A mile above Camp at turning point in bed of torrent.	Sun	34 54 24	
,, 9	3½ miles beyond last Camp (6th)	Sun	35 1 32	
,, 13	3¾ miles beyond Kotelik	Sun	34 48 57	
,, 14	5 miles beyond Camp 11th	Sun	34 37 17	
,, 15	4 miles beyond Camp 12th	Sun	34 27 39	
,, 16	2 miles beyond Dong-yeilak	Sun	34 23 19	
,, 17	4 miles beyond Camp 14th	Sun	34 14 7	
,, 20	1¾ miles beyond Camp 17th (Tabilsa Rocks).	Sun	34 19 14	

Aug. 17 Langar Soolâghaz .. Sun .. "Doubtful observation."
Aug. 25 Yarkand .. .. Sun .. "Doubtful observation (clouds)."
Sept. 29 Shing-loong .. .. Sun .. "Observation doubtful."

TABLE VI.—RESULTS of the OBSERVATIONS for LONGITUDE from LUNAR DISTANCES.

Month and Day (Civil).	Name of Place.	Object to which Moon was Referred	Whether the Moon was East or West.	Resulting Longitude. East.
1870.				° ′ ″
Sept. 1	Yarkand	Sun ..	East ..	76 53 45
,, 1	Ditto	α Aquilæ	West ..	77 30 30
,, 5	Yangee bazar (ferry over the Yarkand River).	Saturn ..	East ..	76 45 15
,, 9	Ooeetoghrak	α Aquilæ	East ..	77 13 45
,, 9	Ditto	α Arietis	West ..	78 11 0
,, 19	Camp Olbek, near Shahidoolla	Sun ..	West ..	77 58 54
,, 20	Ditto ditto	Jupiter	East ..	77 27 15
,, 20	Ditto ditto	Sun ..	West ..	78 22 0
,, 22	1 mile beyond Camp Sooget ..	Sun ..	West ..	78 11 45
,, 22	Ditto ditto ..	Sun ..	West ..	77 45 28
,, 30	Camp Somdo, near head of Karakash River.	Sun ..	East ..	78 8 0

The longitudes contained in the last column of the preceding table show that when the moon is east of the object referred to, the result appears to be less than when the moon is west. The materials available for determining the amount of difference are as follows:—

TABLE VII.—DIFFERENCE of RESULTING LONGITUDE depending on the POSITION of MOON.

Place.	Position of Moon.	Resulting Longitude from Table VI.	Excess of Result. Moon West.
		° ′ ″	′ ″
Yarkand	East ..	76 53 45	
Ditto	West ..	77 30 30	36 45
Ooeetoghrak	East ..	77 13 45	
Ditto	West ..	78 11 0	57 15
Camp Olbek	East ..	77 27 15	
Ditto	West ..	78 10 27	43 12
		(mean of two determinations)	

The mean of the three results contained in the last column of this table is 45′ 44″, half of which, or 22′ 52″, gives the approximate correction to be subtracted from single determinations of longitude, moon west, and added to single determinations moon east. Thus the following final results for longitude are obtained:—

TABLE VIII.—CONCLUDED LONGITUDES from LUNAR DISTANCES.

Name of Place.	Position of Moon.	Resulting Longitude from Table VI.	Correction to Single Determinations.	Concluded Longitude. East.
		° ′ ″	′ ″	° ′ ″
Yarkand	East	76 53 45	..	77 12 8
Ditto	West	77 30 30	..	
Yangee bazar (ferry over the Yarkand River).	East	76 45 15	+22 52	77 8 7
Ooeetoghrak	East	77 13 45	..	77 42 23
Ditto	West	78 11 0	..	
Camp Olbek, near Shahidoolla	East	77 27 15	..	77 48 51
Ditto ditto	West	78 10 27	..	
		(mean of two determinations)		
1 mile beyond Camp Sooget ..	West	77 58 37	−22 52	77 35 45
		(mean of two determinations)		
Camp Somdo, near head of Karakash River.	East	78 8 0	+22 52	78 30 52

Note.—In the "lunar observations for longitude," the first altitude of Capella on Sept. 9, observed for determination of watch error, gives a discordant result, and has not been used. The watch time was probably set down one minute too large.

TABLE IX.—DETERMINATIONS of MAGNETIC DECLINATION (VARIATION of the COMPASS).

Month and Day (Civil).	Name of Place.	Deviation of the North end of the Needle to the East.
1870.		° ′
Aug. 26	Yarkand	2 15
,, 31	Ditto	5 16
Sept. 15	Kichik Yeilâk	2 16
,, 19	Camp Olbek	4 45
,, 22	1 mile beyond Camp Sooget	4 35
,, 23	Chibra	5 37
,, 24	6 miles beyond Malikshah	3 11
,, 25	Summit of Karatagh Col	2 35
,, 27	Khoosh-Maidân	3 42
,, 29	Shing-loong	3 10
,, 30	2 miles beyond Shing-loong	3 58
Oct. 24	Leh	4 20

Aug. 26	Yarkand	The date has been altered from Aug. 25, as given by Mr. Shaw.
Sept. 15	Kichik Yeilâk ..	"Doubtful observation." The date has been altered from Sept. 14, as given by Mr. Shaw.
Sept. 27	Koosh-Maidân ..	It has been assumed that the observations were made before noon of Sept. 27, civil reckoning.
Sept. 29	Shing-loong	The first observed altitude is marked "meridian altitude," but the calculation shows that such was not the case, neither does it agree with the meridian altitude given in Table I.

TABLE X.—HEIGHTS of PLACES above the MEAN LEVEL of the SEA calculated from OBSERVATIONS of the BOILING-POINT of WATER.

Month and Day (Civil).	Name of Place.	Observed Boiling-point.	Corresponding Barometer Reading.	Observed Temperature of the Air.	Resulting Height.	
					As referred directly to the Mean Level of the Sea	As referred to Leh.
1870.		°	Inches.	°	Feet.	Feet.
July 14	Chagra (near Pangong Lake)	186·1	17·461	62	15,282	14,916
,, 15	Masimik Pass	176·0	13·962	51	21,376	21,142
,, 15	Pangloong	182·4	16·103	50	17,347	17,137
,, 16	Pamzal	185·4	17·197	81	16,056	15,430
,, 17	Ditto	186·0	17·423	70	15,484	15,008
,, 18	Gogra	184·8	16·974	62	16,086	15,719
,, 19	Hot Springs	184·1	16·713	72	16,713	16,211
,, 19	Camp below Pass (junction of stream).	183·0	16·319	70	17,361	16,883
,, 20	Summit of Pass (Dr. Cayley's	178·4	14·735	55	19,947	19,668
,, 20	Nischoo	180·0	15·267	48	18,801	18,614
,, 21	Camp in Lingzee-Tung ..	181·7	15·855	50	17,782	17,572
,, 23	Camp in Lak-zang	182·1	15·995	67	17,874	17,435
,, 25	Tarldat	183·6	16·533	55	16,701	16,427
,, 26	Patsalang	182·5	16·139	71	17,699	17,205
,, 31	Kâfir Darra (1st Camp) ..	188·2	18·274	60	13,956	13,622
Aug. 1	Kâfir Darra (2nd Camp). ..	188·9	18·552	64	13,588	13,294
,, 2	Ditto	189·4	18·753	68	13,341	12,995
,, 5	Balakchee	190·7	19·283	65	12,503	12,199
,, 7	Pilatagach	192·6	20·080	62	11,311	11,049
,, 8	Camp below Grim Pass (south side).	190·5	19·200	55	12,485	12,312
,, 9	Top of Grim Pass	183·2	16·390	46	16,776	16,710
,, 9	Kichik Yeilâk	191·1	19·448	45	11,988	11,946
,, 10	Tam	196·5	21·803	64	8,993	8,711
7h. P.M.						
,, 11	Camp Choochoo	193·2	20·338	64	10,970	10,686
2h. P.M.						
,, 13	Camp Arpalak	197·0	22·033	73	8,782	8,380
,, 16	Sanjoo	200·6	23·746	80	6,682	6,210
,, 16	Ditto	200·9	23·894	70	6,432	6,091
6h. P.M.						
,, 17	Koshtak	201·6	24·241	75	6,053	5,648
,, 18	Ooeetoghrak	201·8	24·341	85	5,997	5,462
,, 19	Bora	202·3	24·593	87	5,714	5,149
,, 20	Kargalik	204·0	25·465	86	4,691	4,144
,, 21	Poskiam	205·0	25·990	79	4,064	3,614
,, 22	Yangee-bazar	205·0	25·990	74	4,042	3,657
,, 27	Yarkand	205·6	26·309	89	3,755	3,168
,, 31	Ditto	204·9	25·937	86	4,156	3,611
,, 31	Ditto	205·1	26·043	78	4,000	3,562
Sept. 2	Ditto	205·8	26·416	75	3,581	3,243
,, 3	Ditto	205·9	26·470	78	3,532	3,156
,, 4	Ditto	205·9	26·470	79	3,537	3,148
,, 6	Poskiam	205·1	26·043	72	3,975	3,677
,, 7	Kargalik	204·5	25·726	76	4,346	3,991
,, 8	Bora	203·3	25·103	60	4,963	4,814
,, 9	Ooeetoghrak	201·9	24·391	73	5,859	5,537

TABLE X.—HEIGHTS of PLACES above the MEAN LEVEL of the SEA calculated from OBSERVATIONS of the BOILING-POINT of WATER—*continued.*

Month and Day (Civil).	Name of Place.	Observed Boiling Point.	Corresponding Barometer Reading.	Observed Temperature of the Air.	Resulting Height.	
					As referred directly to the Mean Level of the Sea.	As referred to Leh.
1870.		°	Inches.	°	Feet.	Feet.
Sept. 10	Koshtak	201·8	24·341	73	5,918	5,595
,, 11	Sanjoo	201·0	23·943	66	6,343	6,131
,, 13	Tadlek	195·3	21·260	49	9,550	9,516
,, 14	Kichik Yeilâk	191·8	19·741	42	11,534	11,562
,, 16	Grim Pass	183·3	16·426	43	16,658	16,607
1h. P.M.						
,, 17	Pilatagach	193·1	20·294	50	10,863	10,799
,, 19	Olbek (near Shahidoolla) ..	192·3	19 952	55	11,398	11,267
,, 21	Camp Sooget	189·6	18·833	47	12,913	12,845
,, 23	Chibra	182·9	16·283	48	16,997	16,817
,, 23	Malikshah	185·1	17·085	35	15,422	15,447
,, 24	Camp by Cayley's Lake ..	183·0	16·319	35	16,689	16,681
,, 25	Summit Karatagh Col	181·4	15·751	37	17,704	17,648
,, 25	Camp near Shorjilga . ..	183·1	16·355	33	16,591	16,610
,, 26	Khoosh-maidan	184·8	16·974	35	15,604	15,622
,, 29	Shing-loong	183·0	16·319	33	16,652	16,669
,, 30	Camp Somdo	182·4	16·103	36	17,076	17,046
Oct. 1	Top of "Col" leading on to Lingzee-tung.	180·9	15·578	48	18,236	17,953
,, 1	Camp, corner of Lingzee-tung.	181·2	15·682	27	17,626	17,628
,, 4	Camp, foot of Glacier Pass (south side).	181·0	15·613	22	17,647	17,708
,, 5	Camp at turning-point in bed of torrent.	183·0	16·319	28	16,558	16,5 8
,, 8	Camp 6th, across watershed beyond Lake.	182·1	15·995	30	17,145	17,126
,, 9	Camp 7th in Chaghdo-Loongpa (valley).	183·9	16·640	32	16,098	16,090
,, 13	Camp Kotelik on Shayok ..	187·6	18·039	29	13,832	13,942
,, 16	Camp 13th Dong-yeilak ..	189·7	18·874	41	12,765	12,764
,, 16	Camp 14th, opposite mouth of Changchenmo stream.	190·2	19·077	33	12,357	12,469
,, 20	Camp 17th	192·6	20·080	32	10,937	11,111
8h A.M.						
,, 21	Camp 18th, "Phagra"	193·2	20·338	34	10,610	10,770
7h. A.M.						
,, 21	Camp 19th (above Digar) ..	188·6	18·432	35	13,334	13,385
,, 22	Top of Digar Pass..	181·0	15·613	19	17,588	17,687
1h. P.M.						
,, 23	Leh	192·1	19·868	53	11,494	11,389
noon.						

Kâfir Darra (2nd Camp), Aug. 1. The temperature of the air was not recorded. The value used (64°) is the mean of the next preceding and next following values.

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